BREAKING THE PATTERN

Densification as a catalyst to change spatial and societal patterns in post-war neighborhoods.

Master of Urbanism, Graduation Thesis
Studio: Design of the Urban Fabric

1st mentor: Robbert Jan van der Veen
2nd mentor: Reinout Kleinhans

Nando Versteeg
4704401

Now, more than ever, there is an enormous need for extra housing in The Netherlands. However, since society and politics agreed on preserving the green areas in our country, densification in existing urban areas is the solution for the housing shortage. This way of working is completely the opposite of the post-war reconstruction era. This period of time gave us massive homogenous neighborhoods that were constructed with the idea of light, air, and space and it was the solution to provide people with a home after the second world war. Nowadays, these areas are stuck in their spatial and societal patterns of poor quality of housing and public space and social tension and unsafety, creating unliveable environments. At the same time, the post-war typology, with an open and green character, provides the potential for sustainable urban densification. This is the opportunity to solve the housing crisis while upgrading the urban areas that are in dire need of transformation. This research will seek to find the criteria for urban densification that guarantee an uplift in social liveability through spatial interventions. This will break with the existing patterns to create a healthy and sustainable living environment for all.

Table of Contents

1. RESEARCH PLAN

This research will focus on two main challenges that The Netherlands is facing at the moment. The housing market in the last decade has been upside down, with housing prices exceeding regular valuations and the availability of fitting and affordable housing for many target groups has become problematic. The need to build new and affordable homes is high. The shortage is estimated at 315.000 dwellings. The next question is where these homes are going to be realized. The current social and political motives are towards preserving the open and green areas in our country, thus minimizing the city expansions that popped up on a massive scale after the turn of the century. On the one hand, gives this pressure on the existing urban areas to be densified. On the other hand, provides this an opportunity to upgrade and invest in the urban areas that have been dilapidated and fallen under the minimum living criteria. These areas are the second challenge of this research. Since the turn of the decade, there have been many discussions on the liveability of certain areas in The Netherlands. Research shows that the overall liveability in the last two decades has been going up, except for the places where liveability had been scored as worse. These places are stuck in their downward spiral of poor quality of housing, public space, amenities, social disconnection, and unsafety. Approximately 510.000 people lived in 2020 in neighborhoods that received an insufficient score on liveability. Both topics will be elaborated on and specified according to the research in the following paragraphs.
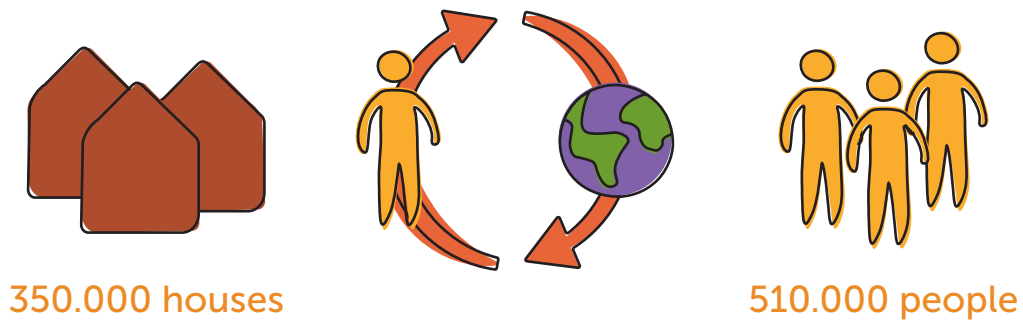

350.000 houses

510.000 people

Figure 1.1

1.2 Housing Crisis

The Dutch housing market has changed dramatically in the last decades. Housing prices have been on the rise and the number of dwellings available has been decreasing (BZK, 2021). The previous report of the Ministry of Internal Affairs on the current state of the housing market in 2021, says that besides the Covid pandemic, the housing challenge has been greater than ever. The prognosis is the need for 1.1 million new dwellings by 2035. In the governmental plans of the housing agenda, there are three main topics within the housing crisis:

1. Availability: there is an enormous shortage of housing.
2. Affordability: there are limited dwellings with a fitting cost of living.
3. Quality: dwellings are unsustainable, they do not fit housing needs and life stages, and liveability is under pressure.
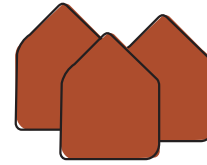
- Shortage of 315.000 in 2022.
- 900.000 new and affordable homes in coming 7 years.
- Inbalance of demand and supply of housing typologies.
- Existing housing stock lacking in energy performance and comfort.

Fig. 1.2 Housing Crisis, author

Availability

There is a great shortage in the number of dwellings. This is partly due to an ever-increasing population and, more importantly, an increase in the number of households. In 2021, there were roughly 8 million households. An estimation for 2035 is 11,3%, resulting in 8,9 million households. This increase results from a growing amount of single-person households, within the target group of elderly and starters. The expectations are that housing production cannot increase as much as the number of households does, thus resulting in a growing housing shortage. The shortage in 2021 amounted to 279.000 dwellings and it is expected to rise towards 326.000 dwellings by 2024. This amounts to 4% of the existing housing stock. This percentage translates to the need for 900.000 dwellings by 2030 and a housing production of 120.000 dwellings per year.

Figure 1.3 Prognoses Progression 2022-2037, Ministerie van BZK, 2021

Affordability

If in any case dwellings are available, they are often not affordable. The prices of dwellings have been rising, in 2021 with 15%. Especially in the rent sector, it is difficult for households with a lower income to find a house. Due to the unavailability of social housing, they are forced to find a home in the free-rent sector or find a house

far from work and amenities. Even for households with a medium income, the situation is difficult. They cannot apply for social housing, but they can also not afford the high rental prices. The current rise in energy costs makes the situation even more tenuous.

Quality

In the last situation, in which a dwelling is both available and affordable, the quality is lacking. A large part of the existing housing stock lacks energy performance, comfort and maintenance. While new construction is currently built en regulated on sustainability, the existing stock of 8 million dwellings needs to undergo the sustainable transition as well. On top of that, dwellings are not fitting to a person's life stage. Finding a fitting home prevents people to move onto the next life phase and stops the moving flow. The elderly do not move out of their family home and occupy a home for a young family. There is also a large vulnerable group that cannot find a dwelling that meets their personal needs, e.g. students, migrant workers, and status holders. This group accounts for 1.2 million people.

Origins

The housing crisis evolved from multiple variables. Firstly, the demography is growing and changing. The population keeps on growing and so is the amount of households, due to a shrinking size of person per household. On top of that, our population is getting older and people live longer in their house. There is also a lack of central control. Without central guidance, people are getting into trouble on a local level and there is no equal share and distribution of focus groups over multiple regions. In addition, the changing financial situations have led to rising costs and low-interest rates provide the wrong incentive, creating an imbalance. The rising housing prices result in a stop of moving flows and thus the availability of dwellings for all different target groups. On top of this, the production capacity is too low and unable to catch up with the demand. This is due to a tight labour market, insufficient governmental capacity for the guidance of construction processes, and the slow uprise of digitized, industrial and innovative construction. The practical reality is also that construction processes and periods take far too long. At the same time are construction projects under immense pressure dealing with new infrastructure, climate adaptation, energy transition, emissions, and nature inclusiveness. Lastly, the transition towards a sustainable built environment is crawling slowly.

The origins are complex and their connectiveness creates a great challenge in resolving this crisis. It asks for a great input of effort, creativity, collaboration and willpower from the government, commercial parties, civil organisation, corporations and residents.
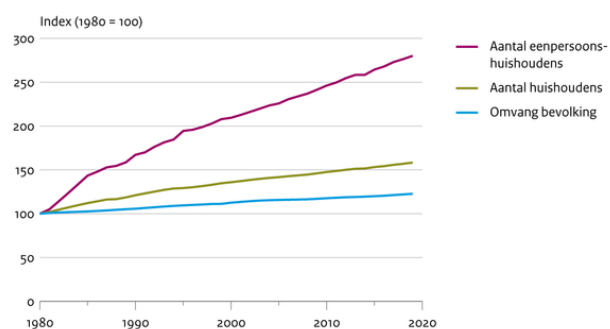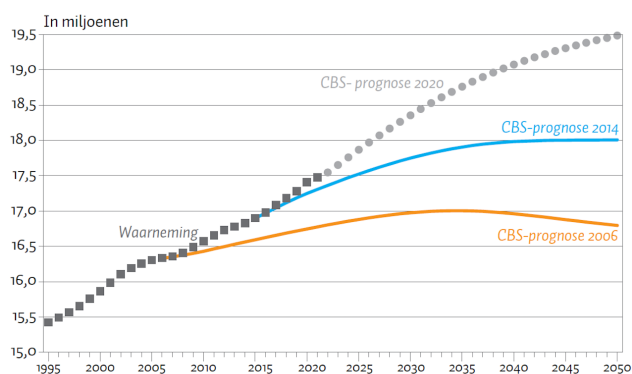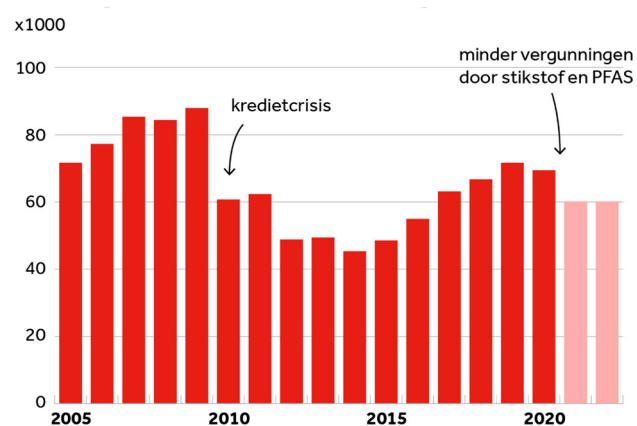

Figure 1.4

Figure 1.5

Figure 1.6

1.3 Liveability Crisis

The Netherlands has been on an uprising trend of improving liveability (K. Leidelmeijer 2022). Since the first version of the Leefbaarometer, the Dutch government has been monitoring the state of liveability in The Netherlands. The results are promising, as it shows an overall image of improving liveability since 2002. However, the overall image does not show that the worst-scoring neighborhoods are consistently falling behind (K. Leidelmeijer, 2022). In a letter to the government, mayors of 15 municipalities press on the urgency of the 'expanding gap' and ask for a national program for liveability and safety (Burgermeesters van 15 steden, 2021).

- **510.000 people reside in unliveable neighborhoods.***
- **Worst-scoring neighborhoods unable to improve.**
- **Differences are increasing.**
- **Underprivileged population stuck in unliveable situations.**

Figure 1.7, Liveability Crisis, Author

The current state of liveability thus shows that the areas of good until insufficient liveability is scoring better and better. However, certain areas within the category of weak liveability are on the same level as they were two decades ago. They suffer from constant pressure and they are unable to get out of this spiral. 193 neighborhoods from 50 municipalities show no improvement. It accounts for 537.000 households resulting in roughly 1,1 million people. for 507.000 of them, the situation is critical.

Increasing gap

The Leefbaarometer is a monitoring and alerting tool that can indicate the current state of liveability (J. Mandemakers, 2021). The first version originates from 2002 and since then the government has been monitoring the liveability in The Netherlands. The analyses of the last 18 years show a clear improvement in liveability. The tool divides the scores into six categories: 1) very good or excellent, 2) good, 3) more than sufficient, 4) sufficient, 5) weak, 6) insufficient or very insufficient. While the first five categories have shown constructive improvement, the last category did not improve. Therefore, the gap is increasing and the differences between living environments are growing, resulting in inequality and an unjust right to quality of living.

Vulnerable target group

Research shows that there is a relationship between the influx of a vulnerable target group in areas that are registered with poor liveability (K. Leidelmeijer, 2018). It seems that the middle and higher incomes are leaving these areas, and more and more vulnerable households come in. This least to a clustering of the vulnerable target group. The result is that their problems of unemployment, financial struggles, low income, low education, physical health issues, and psychological disorders negatively affect their quality of living. Their problems increase the complexity and size of the problems of the neighborhood.
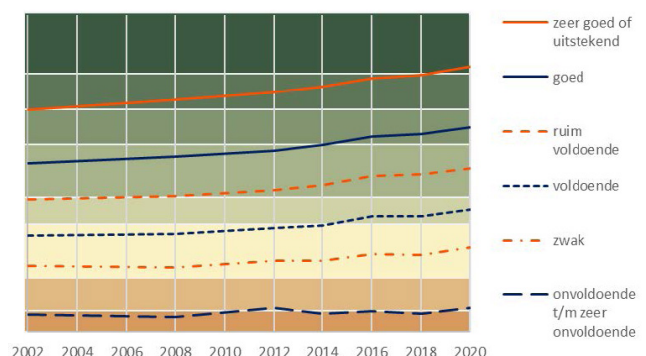

Figure 1.8, Review develoment Scores Leefbaarometer 2002-2020, K. Leidelmeijer (2022), Leefbaarheid in Nederland 2020

Location

The problems of liveability can be found all around The Netherlands. There is a slight balance shift towards bigger cities, therefore The Randstad lights up on the map. However, also in (medium) big cities in the North, East and South parts of The Netherlands, neighborhoods are under consistent pressure.

Figure 1.9

Origins

There have been two different ways of dealing with neighborhood deprivation looking at history (J. van der Velden, 2022). The first is a period that alternates from a physical to a social approach and back. Quickly, it became recognized that only a physical approach is not successful in uplifting a deprived neighborhood. The second way is a period that alternates between a national wide approach to a decentralized district renewal approach. In the last decades, The Netherlands is in a decentralized situation, where the government takes on the role of support system, monitoring, and knowledge development. The locally driven neighbourhood renewal resulted in a neglect of any liveability program. Municipalities are struggling with financial cuts and housing corporations lose their focus on a district approach because of their restricted tasks introduced by the Woningwet 2015. The social structure of districts is under

Figure 1.10, Neighborhoods under Consistent Pressure, K. Leidelmeijer (2022), Leefbaarheid in Nederland 2020

pressure by the increasing influx of a vulnerable target group, while at the same time, there are sanctions on the societal structure. From 2017 onwards, research shows that the limits of district resilience become visible if the percentage of vulnerable target groups keeps growing. Vulnerable neighborhoods need constant policy attention (J. van der Velden, 2022). The policies of the last decades have led to the idea that social housing is only meant for vulnerable target groups with low income, while its task is to supply housing for everybody (K. Leidelmeijer, 2018).

Preview

The increasing problems of liveability have led to new attention for a neighborhood approach. This new attention also came up because of other challenges for the existing built environment (J. van der Velden, 2022). These are an urbanisation and densification task, the accommodation of the ageing population that seeks housing, the extramuralisation, and the collective healthcare approach. On top of that, there is also a sustainability issue, such as the energy transition, the sustainability of existing housing stock, climate adaptation, and the transition to a circular economy. Also from a perspective of safety and the combat of
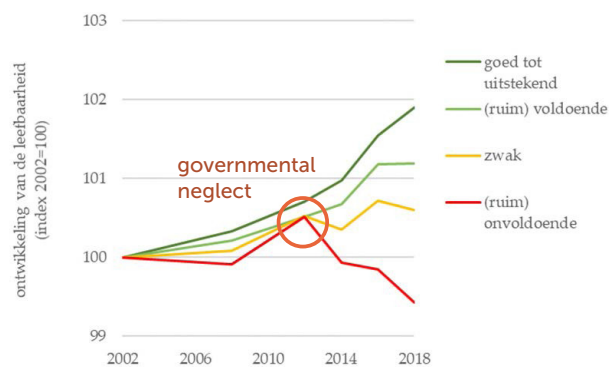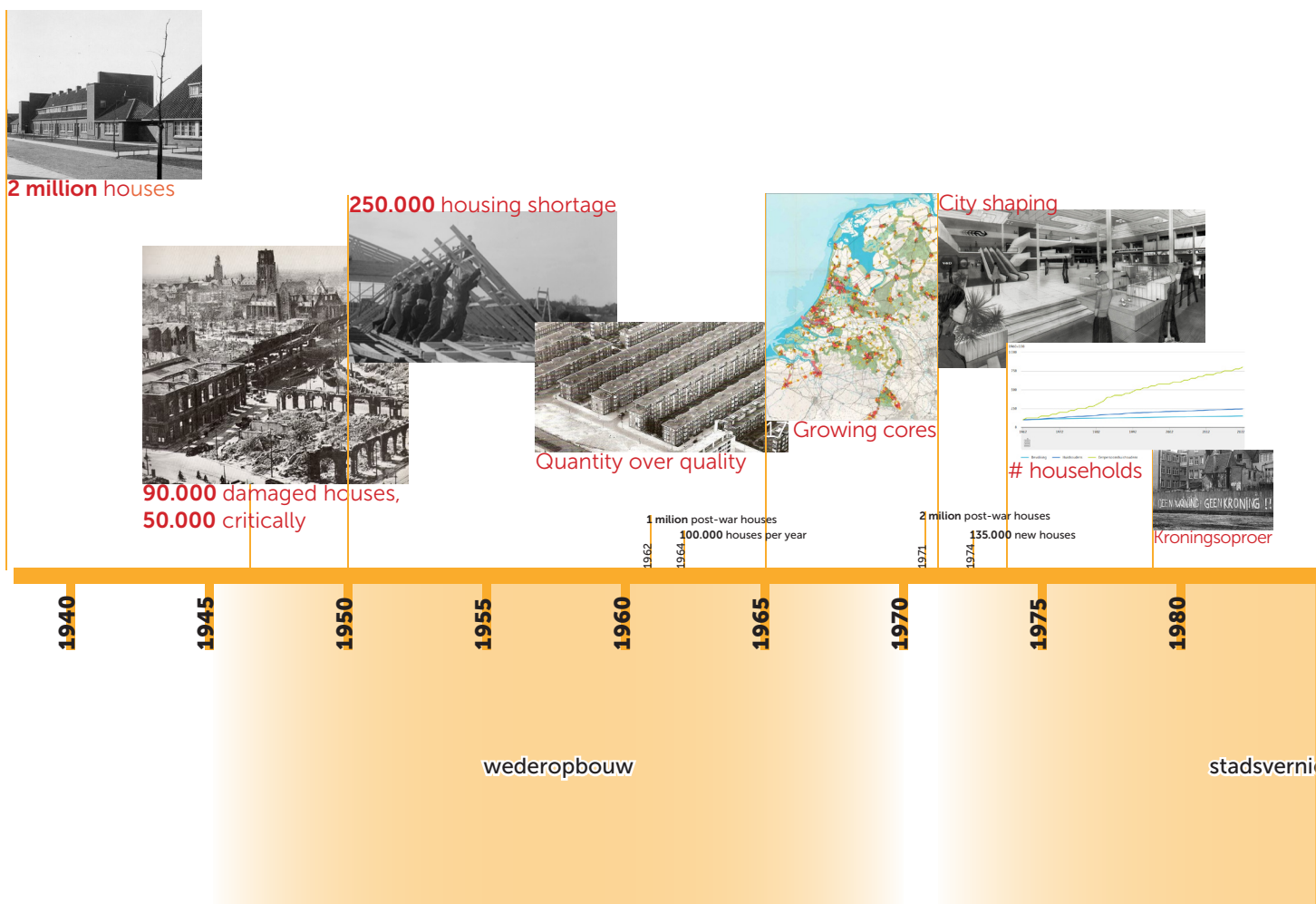
undermining criminality, there is an upcoming urgency towards a neighborhood approach.

In July 2022, the minister of public housing and spatial planning presented the parliament with a plan to act on the increasing issues of liveability. The program aims to take on the task of improving the liveability and safety of lagging districts and neighborhoods. The minister responds to the trend through history and looks into the future accordingly; *''It should not be the place in the city where people live and grow up that determines what their further career and life path looks like. This requires a special effort from the government for these areas and the residents who need extra support''* (Hugo de Jonge, 2022). We are standing at a critical point in time where a certain lack of attention on topics and the rising issues of global challenges come together. Only with an integral, smart and efficient way of working will we cope with the challenges. Working together and taking advantage of pairing opportunities is key to dealing with these challenges quickly, effectively and for a long period of time.

2 million houses

250.000 housing shortage

City shaping

Growing cores

Quantity over quality

households

90.000 damaged houses, **50.000** critically

1 milion post-war houses
100.000 houses per year

2 milion post-war houses
135.000 new houses

Kroningsoproer

1962
1964
1971
1974

1940 1945 1950 1955 1960 1965 1970 1975 1980

wederopbouw

stadsverni

Scheefwonen

Large-scale city expansion

Housing crisis

Catching-up

1985   1990   1995   2000   2005   2010   2015   2020   2025

euwing

grotestedenbeleid

lokaal gestuurde
wijkvernieuwing

leefbaarheid en
veiligheid

1.4 Sustainability Goals

Demolition VS Renovation

The built environment is one of the heaviest polluting industries, accounting for one-third of all CO_2 emissions. One of the ways to decrease the impact of the construction industry on the climate is to start reusing and repurposing the existing stock. In other words, demolition should be minimized and only implemented as a final resource. The building industry is used to large-scale demolition and new construction, because of financial reasons, but also to avoid complexity. The environmental impact of large-scale demolition is enormous, but often the social impact is overlooked. Large groups of people are being relocated and often do not find a fitting home in the neighborhood they lived in. Entire communities are ripped apart and often a new target group finds their way to the new construction because of rising housing prices. Segregation has been a problematic trend in the last decades. Instead, there should be a greater focus on, firstly, the preservation of our existing housing stock. In times of desperate housing shortages, it is unacceptable that demolition is chosen over renovation. The existing housing stock should be updated and expanded, rather than replaced. Secondly, the focus should be on providing qualitative and sustainable housing for the communities in the dilapidated housing within their neighborhood. Preserving the current inhabitants is key to sustainable area development.
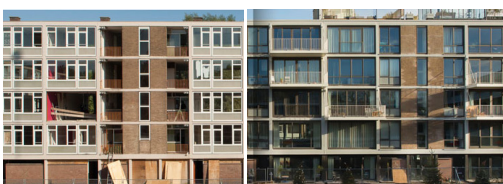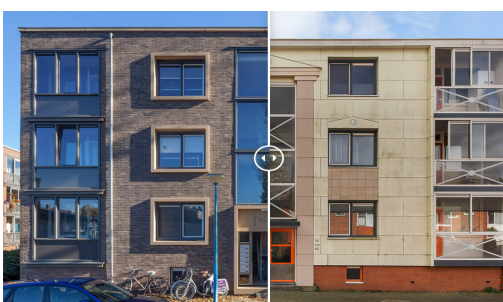
Large-scale demolition

Sloop Moerwijk, Den Haag (D. Veelers, 2021)

Sloop De Gaarden, Den Haag (J. Hoogland, 2019)

Klusflat Klarenstraat, Amsterdam

Renovation

Renovation Complex720, Gouda

The district of The Hague Southwest has a lot of post-war tenement flats. Most of them have been on a downfall both socially and technically. Due to the complexity of these issues, large-scale demolition has taken place. The 4 layered tenement flats had to make place for family row houses. This happened 20 years ago, but it is still happening today. Plans are made to demolish 2000 dwellings to create a better and more liveable neighborhood with a new total of 5500 dwellings. However, residents showed their anger and fear of losing their beloved neighborhood and neighbors (L. van Bree 2021). Residents do get a guarantee of a new home in the neighborhood, but the project will take multiple years, so the wait will be long.

Renovation projects are very common, but they are often more driven by the necessary maintenance rather than a sought-after upgrade. Complex720 in Gouda is a project where both technically and esthetically an upgrade was achieved. The tenement flats are now so-called Nul-op-de-meter (balance in energy consumption and production) and their visual identity is modern with respect to the old character of the buildings (KAW, 2022). A more innovative way of working with the renovation was experimented with in Amsterdam. Here, a tenement flat was stripped and a collection of new residents divided it up into different size apartements so they could build their own homes inside the skeleton of the building (VanSchagen, 2021).

City Expansion VS Urban Densification

The need for housing throughout the history of The Netherlands was often solved by introducing new city expansion areas. These are former unbuilt land around existing cities and villages that were appointed for the construction of spacious neighborhoods consisting largely of solely housing with a focus on row-housing family homes. Agricultural land and natural areas were bought up for urban development. More and more the idea rises that we should preserve the unbuilt areas, for the sake of climate change, biodiversity and health. The Netherlands is a heavily urbanised country, in which 74% of its inhabitants live in urban areas (K. Nabielek 2015). This is one of the highest in Europe. We are now at a point where city expansion has to be limited to preserve the little amount of open and natural land there still is. The city expansion approach of VINEX has no future. Instead, we have to optimise the existing built environment. Our urban areas show many so-called brownfields; areas of urban land that are unused. Multifunctional use is also a way to optimise the urban areas that we have available, for instance combining car parking garages with shops or dwellings, instead of an open car park. There are even great examples of buildings on top of or over existing buildings. Although many of these projects have been famous and expensive architectural expression projects, small-scale top-up extensions have been realised for years already. Therefore, urban densification is a logical and sustainable direction forward.

City expansion

Amersfoort Vathorst, Siebe Swart 2019

Den Haag Ypenburg, Siebe Swart 2017

Urban densification

Karel Doorman, Rotterdam, Ossip van Duivenbode

Martinus Nijhofflaan, Delft, WEBO

VINEX is the name of the Fourth Policy Spatial Planning (Vierde Nota Ruimtelijke Ordening Extra) set up by the Ministry of VROM in 1991. It consisted of guidelines for the locations of new construction sites, both in and outside the city. During the 90s and 00s, large-scale construction projects resulted in massive new neighborhoods that extended the existing urban areas. The neighborhood of Vathorst is such an expansion location in Amersfoort. It has grown to a city district of 21.580 inhabitants. However, the districts are still growing and chewing up parts of agricultural and natural land expanding further out. Den Haag Ypenburg is a similar city expansion that has reached 27.170 inhabitants.

Many projects implement a strategic way of using the existing built environment. Some projects are architectural icons, like for example the Karel Doorman building in Rotterdam. The top-up extension in the shape of an apartment block made it possible to preserve the shopping mall above which it is built. The shopping mall has been restored to its former glory and 114 apartments were realised (nationalestaalprijs. nl). Other ways of rethinking existing urban fabric are visible in Delft. Here, a former open parking spot was used to construct a three-piece apartment block, with an extension to the existing shopping mall on the groundfloor including an integrated parking garage (webo.nl).

1.5 Location

The housing crisis that is currently going on in The Netherlands is not the first time the country is dealing with it. There have been periods in which The Netherlands was struggling with providing housing for the population. The second world war resulted in destroyed buildings and broken cities. After the clean-up, it became apparent that an estimated 90.000 homes were damaged. More than half, 50.000 of those were severely damaged. However, setting up the economy, army and politics was the first priority. The minister of construction at that time was 't Veld. He came up with a program that could deliver 10.000 homes every year. Two years later, the production already reached 35.000. However, the need for homes not only resulted from war destruction but also from a rapidly increasing population. The housing shortage would not be getting smaller, but rather bigger. The minister promised production to be lifted to 55.000 a year and he announced that the shortage would have dissolved by 1958. By 1950, the housing shortage amounted to 250.000 homes.

A new approach was needed In order to cope with the enormous shortage. The traditional way of construction would not be able to provide the production capacity necessary. This was the rise of the so-called system construction. The result was mass-scale city expansions with low- and high-rise apartment blocks. These could be produced very quickly due to their systemic construction approach and repeatability. The focus was on quantity, not on quality. The need for housing was high so productions number had to be met and there was no time to spend on quality. At that time the result was quite positive. The population was provided with housing, streets were designed spaciously to accommodate the expanding car use, and the urban design based on open, air, and light gave a quality to the living environment in the new building typology. Unfortunately, the downfall set foot only a couple of decades later. This was due to little differentiation in the housing stock, a homogenous population, and poor maintenance of the buildings and the public space. The outdated facilities in the houses and the diminishing availability of shops did not help the trend of decline.
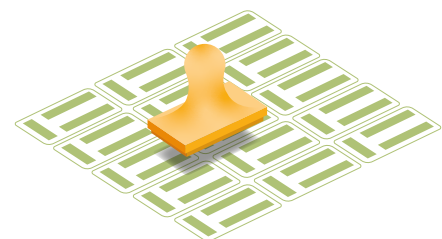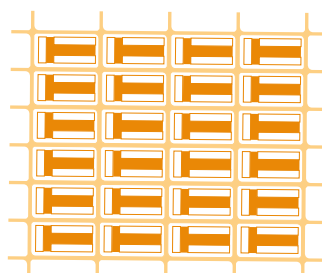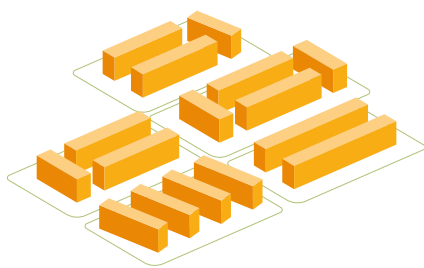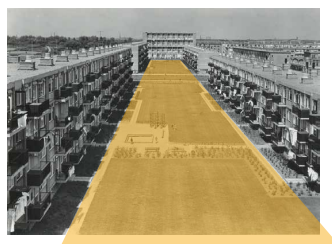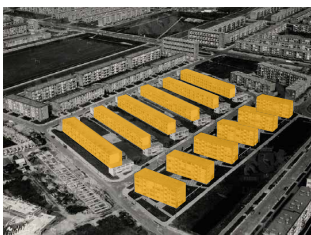
| Strip design	Open space	Repetition

Figure X

While there is a need for transformation of the post-war typology, it also presents great opportunities for the current housing crisis we find ourselves in at the moment. The design principle of air, space and light resulted in an urban design with a lot of open space in between buildings and along the infrastructure. The buildings are also often between 2 and 5 stories high, which also makes it possible to expand vertically. There are great examples of the transformation of post-war neighborhoods that implemented a densification goal. These projects often are a combination of a renovation part and a demolition and new construction that fits within the existing urban fabric. The projects have the opportunity to update the existing housing stock, expand the existing housing stock, and reshape the spatial and social structure. However, most of them only succeeded in the first two, while the underlying problems in most of these places can be solved from the last aspect.

Utrecht Kanaleneiland, Google Earth

This example of Utrecht shows three ways of working with the post-war typology. In the first image, we see the layout of how the design came to be after the first construction. The grid of parallel blocks with short corner blocks can be clearly distinguished. The first step would be to keep everything the way it is and update it on a building scale, meaning renovating the existing building blocks. The next step is to combine this approach with selective demolition. The second image shows that a small corner block with family row houses has been replaced with a semi-high-rise apartment block. The urban fabric is preserved, while there is a big densification step. In the last image, there has been a complete demolition and new construction, on top of the existing urban island. The building typology however has changed completely. High-rise and low-rise are combined consisting of apartement blocks, gallery flats and row houses. The courtyards are gone and replaced by private gardens and shared rooftops.

This is just a small impression of the potential there is in the post-war neighborhood typology. If we want to change our urban environment into a future resilient and sustainable one, we have to exploit synergies. The efforts that have to be put into making the post-war neighborhoods more safe and liveable should be combined with the potential for urban densification of this typology. With this approach, we can create living environments where current and new residents can live happily together in a rugged, inclusive and resilient neighborhood.
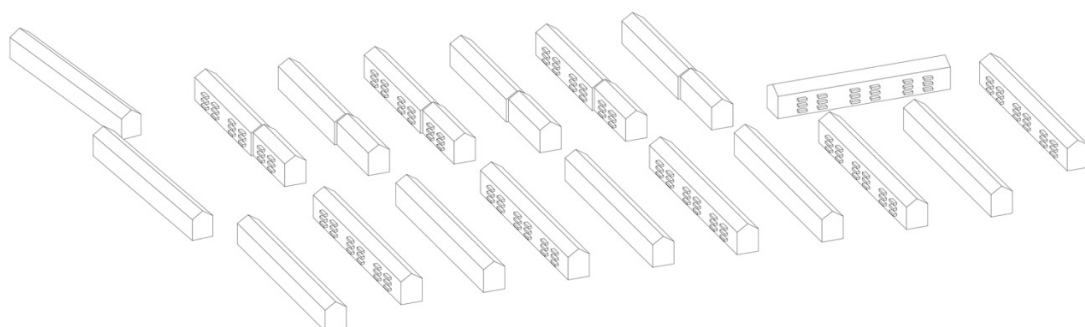
Martinus Nijhofflaan, Delft, WEBO

1.6 Problem statement

This research will be based on the following problem statements:

Housing crisis
- The Netherlands is coping with a housing crisis. This crisis consists of three elements.
- Housing shortage, 900.000 new homes by 2030.
- Miss-match of supply and demand for housing typology.
- Poorly maintained housing with unliveable conditions.

Densification instead of expansion
This problem statement is supported by the following: large-scale city expansion should occur due to diminishing green areas in our country. Densification of the existing urban areas aids in preserving green areas and optimization and maximization of the existing fabric.

Liveability crisis
- The Netherlands is coping with a liveability crisis.
- The worst-scoring neighborhoods are unable to improve
- Neighborhoods are stuck in a vicious circle of poor qualities
- Underprivileged population stuck in unliveable conditions

Transformation instead of demolition
This problem statement is supported by the following: liveability issues were trying to be solved through the mass demolition of urban areas and disruption of housing communities. Transformation of the existing urban areas aids in empowering local underprivileged communities and pursuing sustainability in the existing built environment.

Location problem and potential
The liveability issues and housing crisis can be found throughout the whole of The Netherlands. However, there is an apparent trend of poor liveability and housing in post-war neighborhoods, despite two decades of effort, time, and money. At the same time, the post-war neighborhood typology has great potential for urban densification, more than any other neighborhood typology. The potential can be found in the following characteristics:
- Open and spacious urban design
- Strong social and spatial fabric
- Proper green and blue infrastructure

PROBLEM

Housing crisis

Housing shortage
Miss-match demand and supply
Dilapidated housing stock

Liveability crisis

Under-scoring stay the worst
Vicious circle of issues
Cluster underprivileged people

LIMITATION

No urban expansion

No full demolition

PROPOSAL

Densification

Transformation

POTENTIAL

Post-war neighborhoods

Open and spacious urban design
Strong social and spatial fabric
Proper green and blue infrastructure

GOAL

Implementing densification as a
catalyst to break with spatial and
societal patterns to improve quality
of living for all.

1.7 Research Questions

Main question: How can densification be implemented in order to improve the quality of living in the transformation of post-war neighborhoods?

Liveability
- What does liveability mean?
- How can liveability be measured?
- How do liveability and the physical built environment relate?
- How can liveability be improved?

Densification
- Why is urban densification important?
- How can liveable densification be applied?
- What is needed to sustain population densification?

Post-war neighborhoods
- What are post-war neighborhoods?
- How does liveability score in post-war neighborhoods?
- How can post-war neighborhoods be transformed?
- Which stakeholders are needed for post-war neighborhood transformation?

Research questions

Liveability
- What does liveability mean?
- How can liveability be measured?
- How do liveability and the physical built environment relate?
- How can liveability be improved?

Densification
- Why is urban densification important?
- How can densification be applied?
- How does densification relate to liveability?
- What criteria guarantee liveable densification?

Post-war neighborhoods
- What are post-war neighborhoods?
- How does liveability score in post-war neighborhoods?
- How can post-war neighborhoods be densified?
- Which stakeholders are needed for PWN densification?

Post-war neighborhood densification

Essential / intensive
Explorative design lab on post-war neighborhoods and densification

research

design

studio

M

Literature
Literature -
Literature -
Literature -

Literature
Comparitve
Literature -

Literature -
Exemplary p
Comparitve
Practice - c

Research by d
- Test research
- Validate desig
- Improve fram

Scenarios - referencing

P1

20

Methods

Preliminary & final design

exemplary practice
spatial analysis
case studies

case study analysis
case studies

spatial analysis
practice
case study analysis
ase studies - interview

esign case location
findings
gn and framework
nework

options

Densification framework
- Design principles
- Densification methods
- Liveability criteria

**Final densification
framework**

Stakeholder process

Preliminary design

**Final densification
design**

P2   P3   P4   P5

1.9 Aim of the project

This research and design project aims on answering the question if densification can lead to a positive effect on liveability in post-war neighborhoods. If this is the case, the next question is how densification can contribute to improvements in liveability. If this is not the case, we want to know how densification can still beco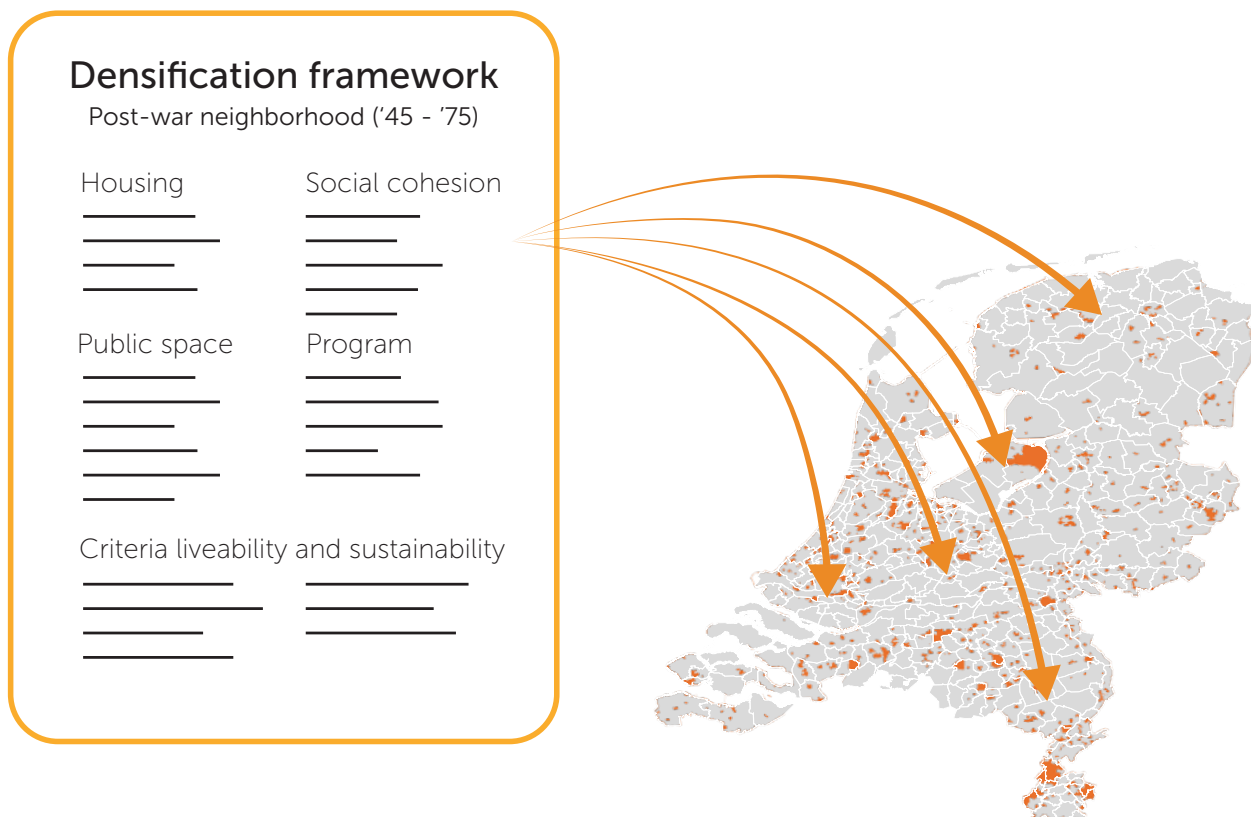me a catalyst for transformation that leads to better liveability. This research takes on the argument that densification is inevitably going to happen and it sees post-war neighborhoods as a place with high potential for urban densification. So, if transformation with densification will take place, this is the opportunity to set up a framework and criteria to guarantee a positive change in the quality of living in these specific living environments. The research aims to relate the inevitable densification to the improvement of liveability.

The societal impact of the proposed systemic change can be rather large. The discussed locations are home to 4% of the national population. The aim is to provide qualitative and proper housing also for this underprivileged target group. The results of this research will also contribute to a more sustainable approach to the existing built environment, in which preservation and enhancement of the existing built environment and communities are key. The aim is to transform these neighborhoods into future-proof and resilient places where everybody can live happily together.

Densification framework
Post-war neighborhood ('45 - '75)

Housing

Social cohesion

Public space

Program

Criteria liveability and sustainability

The topic of my graduation is relevant to this time and age. We are at a time when we have been struggling with the typology of post-war neighborhoods. Not only with their urban fabric that is designed for a different time and lifestyle but also in terms of building and living quality. Society is looking for a way to improve the living quality of these places while also creating a sustainable and resilient building stock. The College van Rijksadviseurs has been investigating the densification approaches in our Dutch history and knowledge platforms such as Platform31 are seeking to find an answer to how the inevitable densification strategies can turn things around positively in vulnerable areas. The scientific field of urbanism succeeds only partially in addressing the relationship and synergies between the improvement of liveability through densification. Densification has the ability to transform and reshape our existing urban fabric, without having to erase a large part of it. In my opinion, this idea has been under shadowed by the political tendencies considering post-war neighborhoods and social housing. For decades, we have been unable to improve our most vulnerable living environments as well as deal with our housing shortage. Now is the time to find sustainable and resilient solutions that will provide perspective.

2. DENSIFICATION

2. DENSIFICATION

There are two ways of dealing with a housing shortage. The first is to expand the built environment, meaning taking up unbuilt areas to construct new neighborhoods. In urban areas, this is revered as city expansion. The second method is to optimize the existing urban areas. Implementations are constructing on brownfields are increasing the density in existing areas. This is called densification; increasing the existing density in terms of dwellings or residents. Science proved that the compact city is a robust, sustainable and efficient form of city development. One of the main reasons to densify towards a compact city is because of the unavailability or unwillingness to use unbuilt land. Without knowing it, a large part of urban development has been forms of densification. These can be great example sto learn from, as nowadays the demand for densification has increased. The question arises how can utilize the opportunity to add value through densification instead of pushing the existing structure away?

2.1. Compact City

The Netherlands is one of the most urbanized countries in the world (Nabielek, 2015). About 75% of the Dutch population lives in un urbanized area. It is not so strange that we live in compact urban areas, because it has been on the national agenda since the 80s. In 1983, the Fourth Note of Spatial Planning was published (VROM, 1983). The policy had two big goals: 1) densification, restructuring, and transformation in the existing urban areas and 2) the bundling of new urban expansion in the immediate proximity to existing cities. The second goal resulted in large city expansions known as the VINEX neighborhoods aroung the edges of existing urban areas. But the first goal specifically focused on intensifying and optimizing the urban areas that are already in existence, thus make the cities more compact. The concept of the compact city is widely discussed topic in scientific research (Burton, 1999). It is often discusses how compact is compact, or whether compactness is related to sustainability. In any case, there are definitely benefits to a compact city when it is compared to urban sprawl; the development of living environment in a great distance from one another (Ahlfeldt et al. 2018).

Firstly, by compacting urban growth, the amount of unbuilt space is preserved. Opposed to urban sprawl, the compact city uses effectively much less land surface. In this way, natural and agricultural open land can be preserved. The second benefits is partly the effect of preserving unbuilt spaces; reduced ecological footprint. Minimizing the amount of space used for urban development limits the impact on the world's ecosystems that are crucial for the global climate. The compact city can also limit pollution that is harmful to global climate. Compactness brings with it a closer proximity. Therefore, the time and distanced for traveling to a destination is greatly reduced. This results in a decrease of green house gas emission and air pollution. Another effect of a closer proximity is the fact that other modes of transport become a lot more efficient compared to vehicular transport. Public transport networks are a lot more favourable in compact urban areas, because there is no traffic and parking congestion, travel times are shorter, and inner city locations are better accessible. In addition, the process of compacting or densifying is a sustainable way of development, because it reuses, optimises or upgrades existing urban areas. This is circular method of urban develpoment. Another benefit of the compact city concept is efficiency, especially in terms of energy consumption. Besides the fact that efficiency is gained by decreasing the distance energy needs to travel, stacked housing, for instance, uses less energy compared to the same amount of free standing dwellings. A higher density of population is also beneficial for urban amenities and the overall local economy. More people bring more demand for commercial, leisure and labour functions. The power of upscaling then again makes economic growth possible. Lastly, social urban vitality can be increased by compactness, because of higher social equity, social mobility and possibilites for social interaction. These are clear advantages that come with a compact city.

Limitation polluting car-use

Re-use of existing urban areas

Support urban amenities

Strengthening local economy

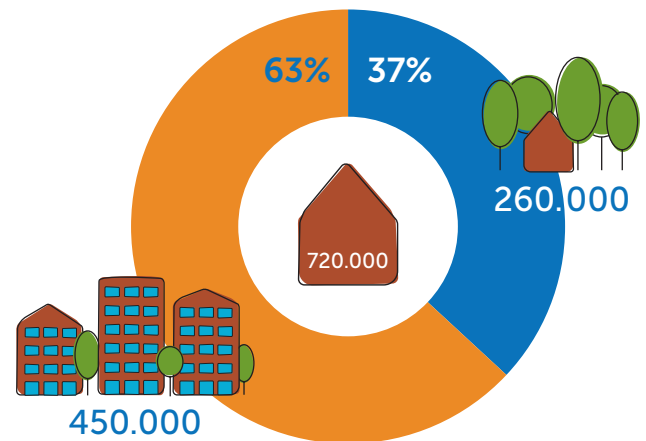*Preservation unbuilt spaces*

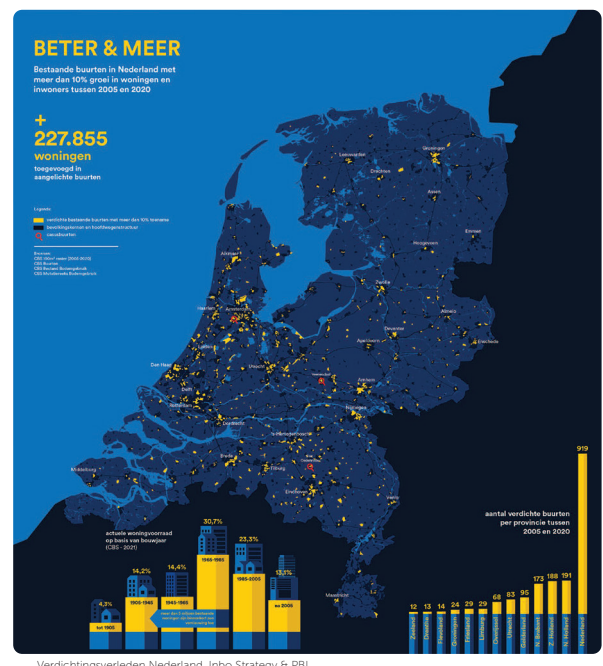*Efficient energy usage*

Social urban vitality

The idea of the compact city is evidently a legitimate reason for the Dutch government to take it up in their policies. Optimization, intensification and compacting existing urban areas can lead to the desired compact city. The key element here is densification. In the context of this research, densification is used as an increase in the density of dwellings and residents. In many cases, economic densification is a side effect of this, but it does not have the focus in the research. As discussed before, densification was part of Dutch policies already in the 80s. Now, 40 years later, it is clear that densification is something we have been doing structurally. Research into the densification history of The Netherlands executed by the National Advisors shows that more than half of the dwellings realised in the last 15 years are placed in an exisitng

*720.000 dwellings added in 2005-2020,
more than 10% increase in 1000 neighborhoods.*

built environment (College van Rijksadviseurs, n.d.). In further detail, 36% of neighborhoods have been densified both in terms of dwellings and residents, 27% have been densified only in number of dwellings and in a thousand neighborhood the densification factor was more than 10%. Almost half a million dwellings have been realized through densification. Another interesting aspect is that it did not occur only in the Randstad, but it is visible throughout the whole of The Netherlands, both in the biggest cities as well as the smallest villages. The board of national advisors presented back in 2010 already a report the compactness and densification projects of The Netherlands (ten Dijke, 2010). A part of this book is an urging note to the government that we have to focus on building within the existing built environments. The book shows many successful projects by which it aims to get rid of the fear of extreme high-rise towers and a distrubtive dissappearance of green spaces in the cities. On top of that, it provides the following recommodations:

- Urban densification asks for commitment of all the parties involved in the process.
- Urban densification is task that involves infrastructure, reallocation, and greenery in the city.
- Urban densification can never be a goal on its own. Through concise research by design for potential location and local qualities, it must benefit the existing situation.

The publication also provides the situation of The Netherlands for which densification can be the solution. Firstly, space is a scarce, especially in our small country. Nonetheless, we have been using it up massively, in the last century increasing our urban areas by a factor 24. The second problem is mobility. Most jobs are still located in and around the city, which means that if you do not live there, you will have to daily commute, preferably by public transport but in many cases still by car. Thirdly and lastly, the prices of housing have been going op drastically and the cities are becoming unaffordable. The result is that the highly urbanized areas are becoming more empty and people have to find housing in neighboring districts and villages and urban amenities loose the support and demand they so nessecarily need. This is reasoning to set up an integral and smart densification approach in order to create vital, healthy and qualitative cities where people want to live, work, and relax.


Verdichtingsverleden Nederland, Inbo Strategy & PBL

2.3 Examples of Densification

The publication of Compact NL advogates densification and intensivation of the existing urban areas (ten Dijke, 2008). It tries to do that by showing examplary projects of densification. In most of these cases, densification was not neseccarily a goal or method, it just happened to be a project realized within an existing built environment. The examples should show that densification is not new nor difficult. For this reason, some examples will be discussed here.

Kanaleneiland, Utrecht

In 1954, the territorial borders of the city of Utrecht expanded, almost doubling in size (Meurs, 2006). Den Hommel created a plan for a new district is located in between the Amsterdam-Rijnkanaal and the Merwedekanaal. in 2003, a new connection was created by building a bridge over the Amsterdam-Rijnkanaal, reaching to an industrial site but also creating a better connection between the inner city and western surrounding. It is a typical post-war neighborhood with strip buildings of four, eight or twelve levels high, thus creating fast open spaces aroung the building blocks. It is also one of the 40 neighborhoods listed by Minister Vogelaar as a problematic neighborhood, dealing with all kinds of liveability issues. Since, the city has been trying to turn it around by multiple different initiatives. Around the location of the bridge, the rowhouses on one side of the stamps have been demolished and replaced by apartment blocks. The allotment needed to be changed and the surface of the stamp enlarged. Herefore, the street parallel to the road over the bridge was removed. The streets going through the stamps are blocked and have become destination streets, thus creating a safer and calmer situation. In the courtyards the situation has also changed. Instead of completely privatised gardens, the courtyards are opened up to create a collective outdoor space. The edge still has narrow private gardens with a storage shack. This creates a better zoning of the open spaces in between the building blocks. These interventions reached the goal of diversifying the housing stock and population, qualitative upgrade of outdoor and public space and a reduction in feeling of unsafety and crime rates (Baggerman, 2009). This example also shows a great way of transformation with respect to the urban fabric in combination with both demolition-construction and renovation.

Poptahof, Delft

The neighborhood of Poptahof in the city of Delft is a late post-war neighborhood. The building typologies are a combination of high-rise towers, medium-high flats and row houses (van den Bout, 2004). The buildings are placed on a large green field in a park-like design. In the transformation of parts of the neighborhood, new building typologies were introduced. Within a stamp, one block of row houses and a medium high flat are demolished and the high-rise renovated and redeveloped. An addition of three new linked building blocks close off a central courtyard. On ground level, this courtyard is dedicated for parking on top of which a deck is created as functional collective space for the residents. Now, there is a great variety of housing typologies and building forms. Outdoor space is divided over balconies, private terraces, collective roof terraces, and collective parking and place of stay deck. The compact form of this closed block type makes it possible to preserve the park-like identity of the neighborhood, while providing n increased amount of dwellings with new private and colllective outdoor spaces. This variety in dwellings, outdoor space character, and building form has a positive effect on the liveability. Infrastructure here has also been changed. Streets only access the building blocks and through traffic is largely blocked. In this way, infrastructure does not block the transition from the new building block towards the central park and onto the existing blocks on the other side of the park. This creates calm and safe public spaces.
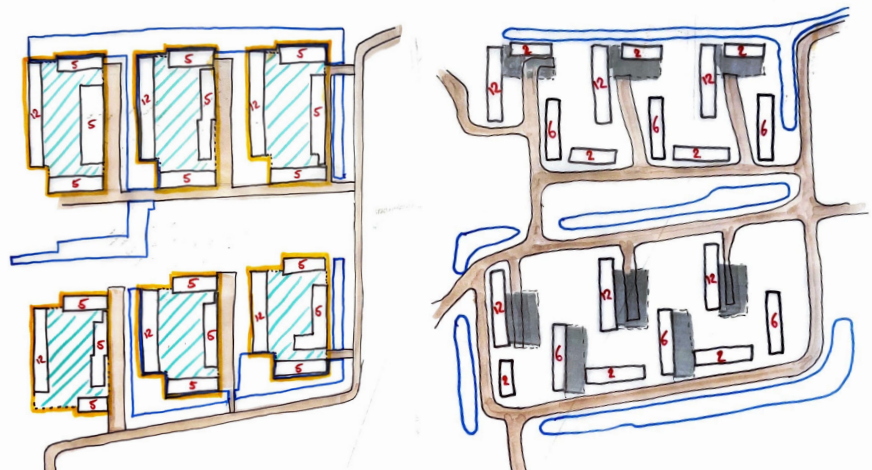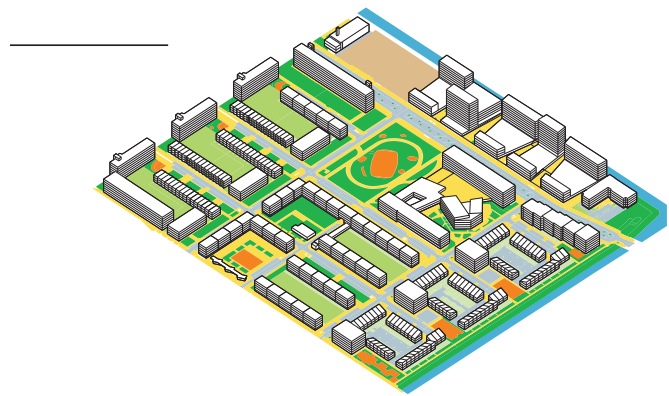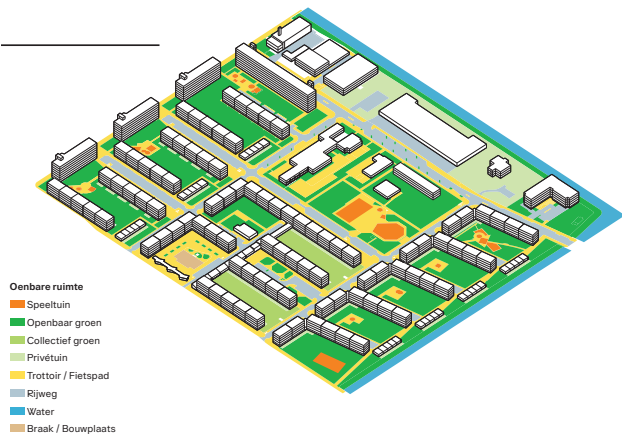

Martinus Nijhofflaan, Delft

A different project that is part of the same urban masterplan is the densification around the Martinus Nijhofflaan. A large shopping area is located here in combination with large parking areas. The goal was to create more housing, take parking up in an integral design and strengthen the position of the shopping area. On the places of the parking areas, new building blocks are realized.

Parking garages are positioned underneath the ground are as an adjacent building, respectively for residents and for the shop visitors. The ground level functions as an extension of the existing shopping mall, with additional shops and stores. Above that, alternating residential towers have been realized. The project shows a smart approach in transforming existing urban space used for solely parking or a combination of parking and shops. The integral redesign mixes functions of parking, shops, and dwellings. It serves as a qualitative addition and strengthens the existing built environment.

Staalmanpleinbuurt, Amsterdam

This neighborhood located in the south-west part of Amsterdam is a post-war neighborhood from the 50s and 60s that dealt with an increasing vulnerable population. The population shifted from western to non-western, from old to young and from middle class to low-income. On top of that, the neighborhood also dealt with a shrinking population, because the middle class income group was not attracted anymore and the large amount of social housing created a clustering of a low-income group. In order to turn the situation around, a large redevelopment plan was set up in different phases. Phase Zero was executed by city district Slotervaart and the housing corporation De Alliantie, to start with important basic interventions and get to redevelopment going, while the first phase focused on close contribution with residents. Specifically for the design of outdoor and public space, participation projects made sure that the redevelopments would be in accordance to what the residents wanted and needed. Beside large-scale new construction projects, renovation projects developed through participation tracks. The plan consist of an intergrated an smart approach with a combination of large-scale demolition and new construction, reallocation of offices to dwellings, introduction of new central buildings for social, commercial and civil functions and intelligent renovation projects.

Oenbare ruimte
- Speeltuin
- Openbaar groen
- Collectief groen
- Privétuin
- Trottoir / Fietspad
- Rijweg
- Water
- Braak / Bouwplaats

One of the projects in this neighborhood is the Klusflat on the Klarenstraat. Here, a portico flat was saved from demolition. Instead, a collective of 30 new residents bought a home, which in collaboration with one another configurated through the structure of the building to form all different kind of dwellings. The buyers could construct their own home, while the housing corporation made sure the structure and exterior ware upgraded. This is a great example of the resilience of the existing built environment, and how innovate and creative ways aid in preserving and upgrading the existing built environment.
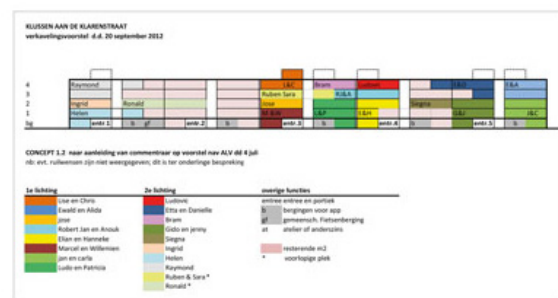
Voorlopige invulling van Excelsheet verkaveling, 20 september 2012 — Provisional filling out of the Excel sheet with regard to the internal subdivision, September 20, 2012

Definitieve verkaveling in driedimensionaal model — Final subdivision in three-dimensional model

Top-up extensions

Besides demolition, new construction, reallocation, renovation and transformation, there is another way of densifying inside the existing built environment. Small-scale top-up extension have been around very long, often expressed through a single roof addition of one or two rooms on top of a row house. However, in the last decades, large-scale projects have been realized that show this idea on a whole new level, preserving the existing buildings and providing new homes, new identity and new resources for the surrounding.

Karel Doorman, Rotterdam

The earliest of these projects is the Karel Doorman in the centre of Rotterdam. The project involved an important shopping building from the reconstruction period. The building was brought back to its original character and estethics and it received a 16-storeys-high apartment block on top of it. The project had three important pilars (Nationale Staalprijs, n.d.); 1) active hidden carrying capacity, 2) divide horizontal and vertical loads, and 3) mega light construction. By these standards, the top-up addition was realised without adjusting the existing carrying structure. The project was innovative at its time by the way it found a creative solution to preserve the building instead of demolition, while at the same time provide the surrounding with a strengthened shopping area, additional homes and improving the liveability. The new dwellings create a more vibrant and lively place all day round, which helps in social control and an increased sense of safety.
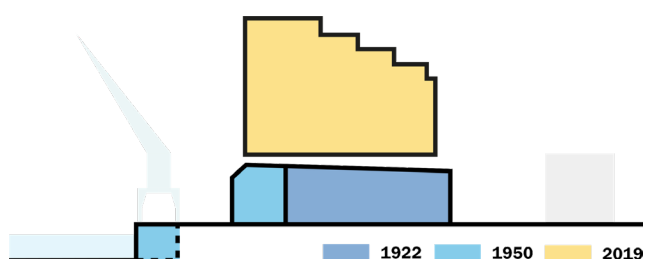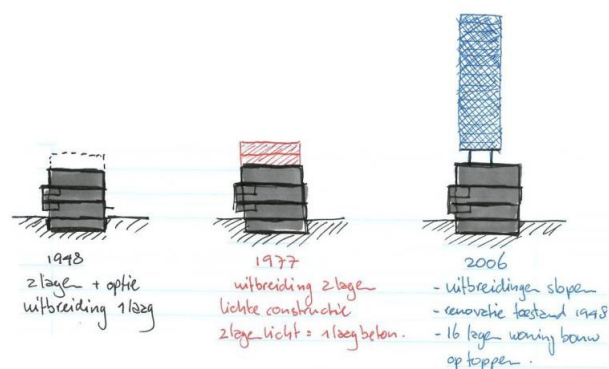
Fenix I, Rotterdam

Another project realised in Rotterdam as well is the transformation of a 100 year old harbour warehouse (Mei Architects and Planners, 2023). The building is fully preserved and a top-up addition was realised, of which the carrying structure goes right through the existing building. In this way, new dwellings with a loft typology were realised, while the existing building received new functions of a mixed-use program with cultural, educational and leisure activities. The structure is flexible in a way that the dwellings can be transformed to new sizes in the future. The extension is seen as an extra layer the building received, making it an iconic piece of the city and enhancing its embodiment in its surrounding. The project is examplery in the way it expanded the existing building by a factor of four, while preserving the harbour character and finding a fitting connection to the existing urban fabric.

## Osdorp Zuidwestkwadrant, Amsterdam

The 60s neighborhood in the east of Amsterdam is one of the many garden city neighborhoods and the first one to be taken on for transformation. It used to be a monotomous neighborhood with anonymous public space that was ideal for criminal activies and boosted a feeling of unsafety due to unclear borders between public and private. On top of that, the amenities were poorly and many could not survive due to not enough customers. Also, the connection to the city of Amsterdam was weak, which made it a detachted living quarter. When the quality of the housing came to a critical point, it was clear that a change was needed.

The transformation plan was widely diverse. Flats were demolished to make way to high-rise apartment blocks in combination with shops and other amenities on the ground floor. The amount and diversity of the public amenities was also enlarged, making sure that the neighborhood could stand on its own and be less depended on other districts. This would also make the neighborhood more attractive for new residents that would have to find their home in the new dwellings. Besides demolition and new construction, parts of the neighborhood were preserved by renovation or transformation. Buildings have been renovated to upgrade the dwellings to the required quality standards and other buildings received additions.

In this way, one of the projects goals of preserving the existing garden city character was preserved. However, at the same time the neighborhood got more diverse, with a wide range of amenities and dwellings. This made it possible for existing residents to find a new home in the neighborhood and move on in their housing career, from a renting an apartment to buying their first house. A new tram line was constructed to make connectivity and accessibility even better. The densification was used as a strategy to make it financiallly possible to intervene on public space and civil amenities, because the transformation was not only a physical one, but more importantly a social one. Residents are very satisfied with the result. The open and collaborative approach of the redevelopment made residents see how important the changes were. They understand that more residents can be beneficial to the quality of living, bcause they create a more lively and busy place. This creates better social control. Clearer border between public and private and through collectivisation and privatisation of open space the feeling of safety is enhanced and outdoor space is used more. In addition, the physical renewal and upgraded and enhanced identity creates a place where people feel happy and at home.

Addition of:
20 shops
13 cafés/restaurants
8 offices
4 fitness facilities
Tramline
Cycling routes

Addition of:
Sportsground
Playground
2 parks
3 schools
Daycare centre

Addition of:
1085 dwellings and 5160 residents.
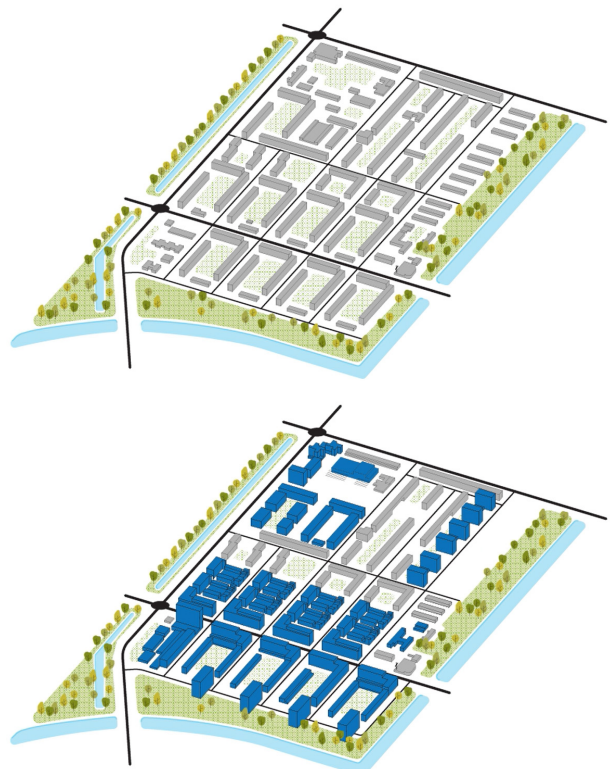
Brouwerspoort, Veenendaal

The city centre of Veenendaal used to be a simple shopping street with lots of space dedicated to cars, in the shopping street itself, but also the infrastructure around and towards the city centre. In combination with the many and big parking places, the character was harsh and paved, creating uninviting and unattractive places. This is the result of the industry that left the city centre and the factories that got demolished afterwards. Veenendaal is a small city but the surrounding cities and villages demand on it quite a lot.

The transformation of the city centre uses densification as a tool to create a new character of the before deserted place. The biggest intervention was the construction of a new canal through the city centre along which an additional shopping street was realised. This is a smart design tool that will not only help cool the city centre in the summer and help retain water in the winter, but it also preserves a spacious character, while the street will more quickly be filled and become lively and busy. In combination with dwellings aboven the shops with entrances on the ground floor, social control is enhanced and activition of the space during the day will help in diminishing the feeling of unsafety. The project can be characterized as a city centre in a village-like fashion.

The densification made way for improved amenities and activities that otherwise would not receive the demand in order to survive. The focus with the addition of new buildings was to not make it a highly urbanised area. This was achieved by taking the human scale into account, limiting high-rise to 10 levels and creating alternating heights. This approach is also visible in the design for public space. There would rather be less than more amount of public space and the ideal public space is one that might be too small. This will make a space quicker busy and therefore more lively. In this way, social control is enhanced and maintenance is limited. Car accessibility was still an important aspect of the regional dependency of Veenendaal. That is why there are multiple underground parking garages that connect directly to the shopping streets in the innercity. Active modes of traffic are now dominant in the streetscape, and cycling and walking is promoted by fascilitating clean, safe and close-by bike parking. The project serves as a qualitative extension to the existing environment, providing diversity in functions, buildings, architecture, experience and housing. The village character is preserved while it still can provide for its regional scope.

Addition of:
28 shops
16 cafés/restaurants
5 offices
4 healthcare facilities
Canal
Underground parking

Addition of:
Cultural centre with library, museum, filmhouse, music school, public square

Addition of:
610 dwellings and 940 residents.

3. LIVEABILITY

3. LIVEABILITY

Certain topics are very popular, while at the same time consist of a lot of ambiguity, making it unclear whether the same topic is being discussed. Liveability is one of them. This term has been talked about this century over and over again. It can be found in literature, news articles, governmental policies and much research. However, there is not one clear definition of this concept and it has different meanings in different contexts. Therefore it is more than important to define the outlines of what is talked about.

This chapter will explore the concept of liveability. After a short broad view of the concept, boundaries will be set based on the context of this research. The context is the built environment. The next step is to contextualize the concept into spatial elements, as this will be helpful for the urban designer. Afterwards, methods of measuring urban liveability are analyzed as well as the conditions in which the state of liveability changes. Lastly, the concept will be looked at from a national perspective, meaning what the state and history of liveability are in The Netherlands.

3.1 Scientific Knowledge

Definition

The first Google search on the definition of liveability provides me with the following answer from Cambridge Dictionary: ''the degree to which a place is suitable or good for living in'' (Liveability, 2023). This definition consists of three key elements.

The first is *a place*. This already creates the first layer of ambiguity, because every place is different. For example, the liveability in Antarctica will be quite different from the liveability standards in the Sahara or the Amazon. Therefore, the place is a key variable in the definition. The second key element can be found in the word *suitable*. It refers to a criterium of elements that are essential to be able to live. Again, this can be very different for different objects or living beings. For instance, human beings need oxygen and water to be able to live. Therefore, the sun is indicated as an

''Liveability; the degree to which a place is suitable or good for living in''

Figure X Definition of liveability

unliveable place, because it does not have the criteria for humans to live in, such as oxygen and water. The last key element is the relationship between an object and its surrounding. As explained, the criterium to live refers to an object or a living being and the place refers to the surroundings or environment of that object or living being. The relationship between these two elements completes the definition of liveability. If this relationship is a good one, it can be stated as liveable. If this is not the case, the context can be seen as unliveable.
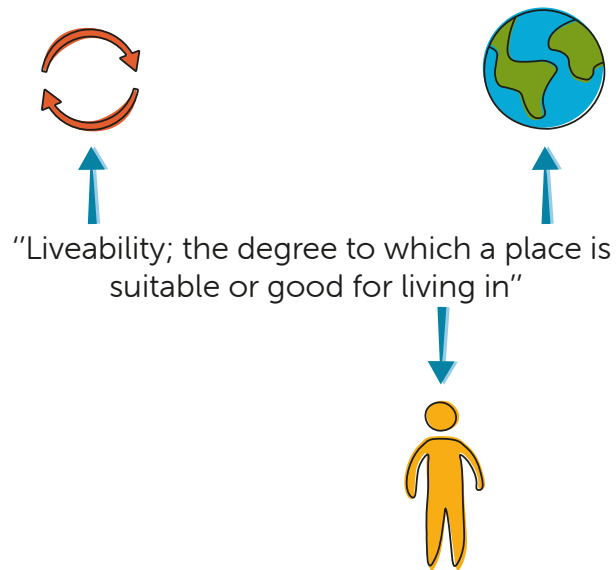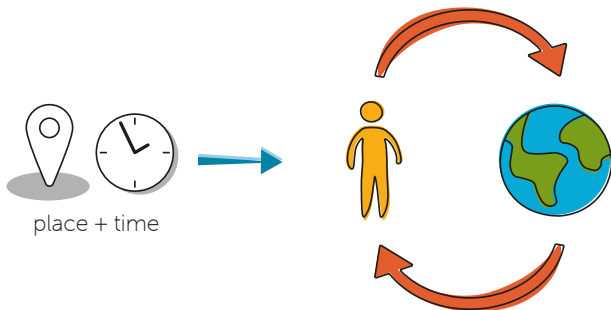

place + time

Figure X Liveability dependecy

It is important to understand that the concept relies on two variables; place and time. The place has already been talked about; explaining that a different context leads to a different score on liveability. The factor of time has to do with the criterium for liveability. In the example of the human being, the criterium for being able to live is quite straightforward, which is oxygen and water. This example is a scientifically proven criterium. However, in a different context, the criterium is not so clear and is bound to personal opinions or ideas that cannot scientifically be proven.

These ideas change over time. For the homo-sapiens, the home was a shelter against the elements and a place to stay warm by a fire. In the 21st century, the home has many more criteria.

In addition, liveability is the bare minimum of what is needed to be able to live (van Dorst, 2005). It talks about the basic needs or the minimal value of its surrounding. This means that it is not a quality standard that should be strived for, but rather the minimum conditions for an environment to be good enough to live in.

Implementations

For this research, it is important to set perimeters on the concept of liveability. The context of this thesis takes into consideration that the object and the place in the definition of liveability stand for the residents and the neighborhood. However, there is still a wide range of applications for this definition. A list of contextual usage is listed below (van Dorst, 2005). This will help gain an understanding of how complex and widely used the concept of liveability is.

1.   A liveable world

This is an idealistic world that is strived for by groups of people committing to peace, safety and development aid. It does not necessarily concern the living environment, but rather the societal malpractices.

2.   Political use

Used as a collective concept for (malpractices in) health care, education, safety, multicultural community and transport issues. The concept is used in a negative sense, meaning some problems that need to be solved. In The Netherlands, multiple local political parties have taken the concept in their name (Leefbaar Hilversum, Leefbaar Rotterdam, etc.)

3.   Communicational use

Used as a non-defined goal, in order to gain consensus with the idea that everybody wants to support liveability. However, because it is undefined the implementation is extremely broad and parties often collide on the different ways of dealing with improving liveability.

4.   Quality of living environment

A good living environment can have a positive effect on the well-being of the residents. A good living environment is recognizable, clean and attractive and results in residents' eagerness to work, live and reside in that place.

5.   The apparent liveability

The relationship between residents and their living environment. It can be depicted in the level of how long and how happy people live in their environment.

6.   The perceived liveability

The level to which residents are satisfied with their living environment. The subjective experience of residents forms the base. Therefore it is influenced by personal characteristics, experience and interpretation.

7.   The supposed liveability

The level to which the living environment complies with the supposed criteria. The supposed criteria form the base here. It is the sum of aspects of environmental hygiene, physical characteristics of the surroundings and social aspects. The supposed liveability is the operationalization of the quality of the living environment.

Practice & theory

The last three implementations of the concept of liveability depict its complexity of it. The apparent liveability is about the reciprocal relationship between an object and its surrounding. In theory, this is the scientific way of explaining the concept, because it takes into account how the object and the environment correlate to each other. However, it is very difficult to put this into practice. Therefore, in practice, the idea of the perceived and supposed liveability is a lot more common to use. The perceived liveability is about how a person rates their surroundings. This can for instance be investigated by doing a survey and asking people how satisfied they are with their surrounding. The supposed liveability ,on the other hand, takes up the position of the environment. Society or research sets characteristics that suppose what makes an environment liveable. This a way to determine what areas are supposedly liveable and which ones are unliveable, but it does not take into account whether this is in line with peoples' perception, which can be different. Combining both theories is essential to reach a complete translation of the apparant liveability into practice and make it a workable concept.
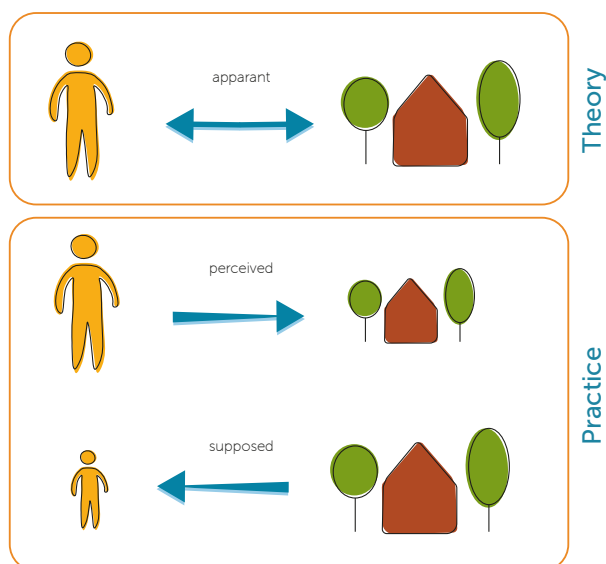

Figure X Liveability in practice and theory

3.2 Liveability in the Built Environment

After examing the concept of liveability in a scientific context, it will now be related to the built environment. As explained before, liveability is used in politics, policies, and protests, but in order to make it a workable concept in the field of urbanism it must be related to the context of the built environment. This will help answer questions such as; what makes an area liveable and what aspects contribute to a liveable environment?

Hierarchy of Maslow

Liveability is greatly determined by the needs and desires of an individual. The hierarchy of desire by Maslow is a great example of what it entails (1970). This theory explains the internal needs of human beings. The hierarchy explains that there are certain desires that first need to be fulfilled before the next level of desires can be sought after. The hierarchy is as followed:

1. The bottom two layers are basic needs, such as physical and safety needs. These needs consist of basic elements necessary to live and to survive. For human beings, this entails air, heat, water, and food, but also health, shelter, and personal and emotional security.
2. The next layers consist of psychological needs. This deals with a sense of belonging and love, as well as esteem needs. This is about affection and belongingness to a social group such as family and friends and esteem reflects on self-respect, respect from others and prestige or a feeling of accomplishment.
3. The third and highest level is about self-fulfilment needs. This is the phase of personal development and deals with self-actualization, meaning developing the full potential of what one individual can be. Examples are having a partner, being a parent, utilizing talents and pursuing life goals. Spiritual needs are also a part of self-fulfilment.
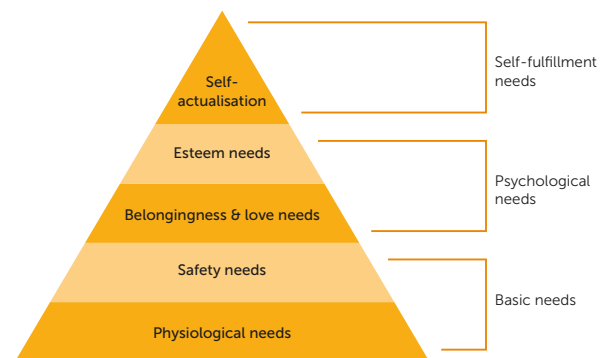

Figure X Liveability in practice and theory

The theory of Maslow helps gain an understanding of what people are seeking in life and their living environment. It could be said that a living environment in which people are able to seek the needs of the highest level of Maslow is a qualitative and liveable environment. Besides the needs of individuals, the environment must also have certain needs, as explained by the theory of Vroon (1990). This theory discusses that the environment must have certain basic characteristics that control human behaviour. These so-called laws are as followed:

1. People and animals require change.
2. Humans want to constantly be able to interfere in their environment, thus exercising control.
3. There should be meaning attached to incentives.
4. Humans strive for their own territory.
5. Humans are in need of connection to the natural environment.

Both theories gain us an understanding of what the living environment should be in order for it to provide a quality of life. The living environment should provide the space to gain personal needs. It should also be a dynamic environment that is open to change, from external factors or from its users, while still having a clear and readable overview.

Aspects

However, it is still unclear what aspects determine the level of liveability in the relationship between an individual and their environment. As said before, the apparent liveability finds two interpretations exercised in practice; the supposed and the perceived liveability. These interpretations of the general concept of liveability are used in practice because they are less complex and they can be in a way measured. The supposed liveability indicates

certain aspects of the built environment that suppose to determine the liveability of that place. The aspects are based on research, but also on gut feeling and a political agenda (van Dorst, 2005). Therefore the relationship between the aspect and liveability cannot always prove to be a causal one. Take the example of litter on the street. There is no proof that litter on streets has an impact on liveability. However, it is a way for residents to show dissatisfaction with the governmental approach, thus it becomes a political agenda. Below, a list of aspects of supposed liveability can be found (v/d Wardt 1998, v/d Valk e.a. 1998, RIVM 1998, v. Eijk 1998, Aedes 2000, cited from van Dorst, 2005). The aspects are both from a spatial and social perspective:

- parking facilities
- green and water in the neighbourhood
- housing density and population density
- liveliness, attractiveness
- crime, vandalism
- social safety, road safety
- street dirt, traffic noise, soil pollution
- number of moves per year
- percentage of home ownership
- average disposable income and income development

- population composition (heterogeneity, share of 'inactive' people)
- presence, quality and proximity of facilities
- the size of the dwelling and the number of rooms
- the quality of the indoor environment
- whether the dwelling suits the household and whether it is suitable for lifelong learning
- the state of maintenance of the house and the garden
- private parking or parking space in front of the house
- privacy, noise and nuisance from neighbours

For all of these aspects, there is data available which can determine whether it scores bad or good. If these aspects are then also answered by residents (perceived liveability), they can be combined to determine a form of the apparant liveability. However, as indicated before, these aspects often do not have proof of having an effect on liveability.

The perceived liveability is based on the value that residents give to their surroundings. There are certain aspects that residents have to grade considering the built environment. The perceived liveability is often more dependent on social aspects, such as the amount and quality of social relationships (van Dijk, Flight & Oppenhuis, 2000). The perceived liveability can be investigated through surveys and the aspects that deal with perceived liveability can be found below (Van de Wardt en de Jong, 1997):

- A nice, well maintained, and neat neighborhood
- Space and greenery
- Absence of street noise and nuisance
- Percentage of unemployed people living in a neighbourhood
- Quality of social relations
- Perceived rate of property crime

- Housing evaluation
- Absence of neighbors rumors and other nuisance of co-residents
- Not too much heterogeneity and variety
- Quality of housing stock
- Amount of public greenery
- Social structure

It is possible to establish the general apparant liveability when the practical implications of the perceived and supposed liveability are combined. Therefore, statistical analysis must be combined with a survey or a behavioural analysis.

There is now also a first idea of what aspects of the built environment are linked to liveability, although the relationship is not defined yet. The aspects listed above can be categorized into three different domains of the built environment: 1) safety, 2) spatial or physical, and 3) social. These domains are standing at the grounds of the definition of a liveable living environment; a place that stimulates and sustains a healthy, pleasant and sustainable lifestyle. In this definition, healthy refers to the basic needs of Maslov, considering the personal health and physical safety of the residents and the ecological health of the environment. Pleasant in the definitions refers to the layers of psychological and self-fulfilment needs of the residents and the comfort and adaptability of the environment. Lastly, sustainable means environmental en climate sustainability as well as future resilience for future residents.

Now that there is an understanding of what liveability means in the context of the built environment, there

is a need to get an understanding of what elements of the built environment influence the level of liveability. Therefore, we will take a look at different tools that are used to measure liveability. Be aware that this concept of statistically measuring the quality of a living environment refers to the supposed liveability, meaning how liveable one place is for individuals (determined by people's idea of liveable).

Measuring supposed liveability

One of these tools is the Leefbaarometer. This tool was developed for the Dutch government on behalf of the Ministry of Internal Affairs in 2008 (Leidelmeijer et al., 2008). It can estimate for an area of The Netherlands the liveability level based on multiple environmental characteristics. The adopted definition of liveability of the tool shows us that we are dealing with the supposed liveability here: *"the extent to which the environment matches the demands and wishes placed on it by humans."* (Leidelmeijer & Van Kamp, 2003). The tool understands the characteristics of liveability very well, as it is periodically updated and adapted to the changing ideas of what people think a liveable environment indicates. The tool compares the selling prices of dwellings with a stated preference for the living environment by people. It uses 100 characteristics of the living environment within 5 categories. The model behind the tool can be found on the right page. It is very important to state that because this tool deals with the supposed liveability, the tool can only be used to monitor and alarm the level of liveability. It is merely a very well-calculated guess of what places could be dealing with liveability issues. For this research, we want to learn from this tool two different things. The first is what physical elements of the living environment can have an influence on the level of liveability. The second is the most important indicator of a liveable environment.

For the first element, the first step is to look at all the elements that have a physical characteristic. This means that we can drop most elements from the topics of Nuisance & Safety, and Social Cohesion. The next step is to filter out geographically determined elements. These are elements that we cannot design because they are geographically present. The characteristics that are left over can be categorized into different elements:
Qualitative (health): the quality of air and sound pollution, water disturbance and heat stress, comfort and energetic quality and maintenance of dwellings.
Proximity to and presence of: infrastructure, public transport, shops and leisure, healthcare and education, walkability and cyclability.
Diversity of and mix in: landscape, function, dwelling typology, ownership, population.

For the second element, we take a look at how much every aspect weighs into the overall score of liveability. The five topics are ranged accordingly starting from the bottom: 5) physical environment, 4) housing supply, 3) social cohesion, 2) amenities, 1) nuisance and unsafety. It is interesting to see that the topics that weigh in the most consist of the least measurable elements. The reason for this is that these topics are social and personal opinions, which are difficult to collect statistical data for.

In short, we now have a list of physical characteristics that we can work with in order to boost liveability. However, these physical elements contribute in a small way to liveability. They form a good base for a liveable design, but in order to have a better impact we want to include elements of the top-tier level. Therefore, further research is needed. These elements of the top tier level show an overlap with the perceived liveability. The tools that determine the perceived liveability might provide us with a clearer idea of elements to include.

NUISANCE & SAFETY

Crimes recorded
Perceived safety
Perceived nuisance

27 %

AMENITIES

(Public) transport
Shops/retail
Education
Care and support
Hospitality/meeting
Leisure, culture, etc.
Sports facilities
Runway accessibility

26 %

SOCIAL COHESION

(Diversity by) stage of life
Social cohesion
Mutation rate
Density of inhabitants
Population development

22 %

HOUSING STOCK

Residential vacancy
Foundation problems (pile rot)
Energy quality
Specific poorly maintained segments (ownership, value)
Use of solar panels
Renovations of dwellings (based on proxy energy quality)
Housing types (size, year of construction, type, height)
Density of development
Ownership mix
Home ownership
Home ownership in relation to insufficient income
Proportion of listed dwellings
Overcrowding

17 %

BUILT ENVIRONMENT

Natural environment

Air quality
Noise pollution
Non-ionising radiation
Wind chill/heat stress
Water nuisance
Groundwater nuisance/soil subsidence
Earthquakes
Flood depth
Proximity to forest/green space
Air quality
Proximity of landscape attractive for recreation
Variety of landscapes

Infrastructure

Proximity of (through) roads
Proximity of rail infrastructure
Road safety
Car density
Proximity to wind turbines
Proximity to high-voltage pylons
Quality of pedestrian and cycle paths
Functional mix
Vacancy of non-residential property
Proximity of (through) roads
Walkability

6 %

Measuring perceived liveability

The way that perceived liveability is measured is through surveys. In this way, it is possible to determine the overall image of how people experience the level of liveability in a certain place. There are many different kinds of surveys that are being used, but we will be looking at the Leefbaarheidsmonitor (Onderzoek Lemon De Leefbaarheidsmonitor, n.d.). This tool is designed by Rigo, a research company that executes liveability surveys for municipalities, housing corporations, and cities. The topics that are discussed in the survey are largely the same as the ones used in the Leefbaarometer: physical environment, social environment, safety, and nuisance. Questioned people will answer a number of questions concerning these topics with a score from 1 to 10, indicating how much they do or do not agree with the statement. The questions look into to following aspects:

- **Quality of house**
- **Quality of living environment**
- **Green and play facilities**
- **Presence of public amenities**
- **Social situation of living environment**
- **Loneliness**
- **Nuisance**
- **Sense of safety**
- **Progress and responsibility of liveability**

On the right page, you can find one example of such a survey to gain an idea of what it looks like. The questions are quite similar to the questions that were answered in the statistical data analysis of the supposed liveability. The biggest difference is that the survey provides an image of what people actually think about the aspects of liveability in their neighborhood. This could give a different image than the statistical data analysis provided. Therefore, the survey is a crucial step to execute and compare these findings with the findings of the statistical data analysis. It is a way of checking whether the presumed assumptions are actually correct or not.

The questions from 7 until 13 look at the aspects concerning safety and social cohesion. The questions try to gain information about social interaction and social conflict between residents, specifically between residents with different backgrounds. It is also looking for information about the sense of safety and sense of nuisance, which are precisely the same aspects of social cohesion in the Leefbaarometer. However, one big distinction can be made here. The question asks whether the crime that might be present is actually bothering, as well as whether an individual feels safe, rather than asking if their neighborhood is a safe place. This difference can be explained by the factual characteristics of a place and the perceived characteristics of people's personal opinions. While a certain area might have a higher amount of crime rate does not have to suggest that people are directly bothered by that crime, and therefore rate the neighborhood's liveability lower. This distinction shows the complexity of liveability. It shows why in practice it is more feasible to divide the complex concept of the apparant liveability into the supposed and perceived liveability.

Another survey that is used at a national level is the Veiligheidsmonitor (Centraal Bureau voor de Statistiek, 2022). This population survey is issued by the Ministry of Justice and Security and the Central Planning Bureau for Statistics and it looks into the subjects of liveability, safety, and victimisation of crime. Similar to the Lemon tool, people answer multiple questions in different categories in terms of how much they do or do not agree. For the topic of social cohesion, the survey states the following statements:

1. People in the neighbourhood hardly know each other.
2. People in the neighbourhood get on with each other in a pleasant way.
3. I live in a pleasant neighbourhood where people help each other and do things together.
4. I feel at home with the people who live in the neighbourhood.
5. I have a lot of contact with other local residents.
6. I am satisfied with the population composition in the neighbourhood.

Questionnaire liveability in your neighborhood

1. How do you like your neighbourhood in general?
2. How do you rate the quality of housing in your neighbourhood?
3. How do you rate the living environment in your neighbourhood?
4. What do you think of the green spaces in your neighbourhood?
5. What do you think of the play facilities in your neighbourhood?
6. What do you think about the quality of facilities in your area?
7. **How do you rate the involvement of neighbourhood residents in your neighbourhood?**
8. **Do residents of different income groups in your neighbourhood get on well with each other?**
9. **Do residents from different ethnic backgrounds in your neighbourhood get along pleasantly?**
10. **Do you experience nuisance from (the behaviour of) others in your neighbourhood?**
11. **Does crime bother you in your neighbourhood?**
12. **How safe do you feel?**
13. **Do you experience nuisance activities in your neighbourhood?**
14. Are you bothered by pollution in your neighbourhood?
15. Are you bothered by traffic in your neighbourhood?

Social cohesion

These statements provide a good insight into what social cohesion entails. It is about recognition, knowing who the people are that live next to you. It is also about how well along you get with those people and how much contact they have with each other. If we are intervening in the physical realm of the living environment, we want to aim at creating places that boost social interaction, a sense of belonging (to a place and to co-residents), and local participation (Forrest & Kearns, 2001). These places should avoid anonymity, space for crime, and lack social control.

Design elements that deal with social interaction are, for instance, common or shared places. This can be a shared living room, repair workshop, or communal garden, but it can also be less voluntary places such as a collective parking for cars or bikes, a central entry hall for an apartment building, or a communal laundry room. In terms of a sense of belonging, it is important to make people attached to a place. This can be achieved by a certain function or control that can be executed in a place. Therefore a place must have either a specific function or leave the space and opportunity for people to create a function there. In this way, the place gives a purpose for people. Social control can be boosted by creating visibly bordered spaces that can be directly overviewed and that also are surrounded by people who view and therefore can control the space. This means that a place should be clearly defined and bordered, be of a human scale and size, and have residents located around it that can have visual control over it. Lastly, a place should be lively. This means that there should be enough people using the place, the place should have a purpose and the place should be able to be used throughout time, throughout the day and throughout the seasons.

3.4 Liveability in The Netherlands

History

As explained before, the liveability issues in The Netherlands have risen to a crisis. How has it come so far and why were the issues not addressed earlier and if this was the case, why did the government not pick up on this? Platform31 looked back on 75 years of urban renewal and neighborhood approach (J. van der Velden, 2022). Throughout history, there are different periods of urban renewal with different approaches.

After the world war, the focus was on rebuilding the country and repairing our damaged cities. Besides the repairs, work also started on cleaning up our existing urban areas, meaning clearing out slums for large shopping boulevards and large-scale offices. At the same time, it became apparent that there was a great housing shortage/ This resulted in a big focus on housing production in which quantity came before quality. Large city expansions were realised to provide new homes for people from the cleaned-out slums and to deal with the overall housing shortage. In the 70s a lot of critique came up on the fact that there was no focus for the residents in the reconstruction approach. The focus shifted from demolition and sanitation towards 'construction for the neighborhood', focusing on the preservation of existing urban fabric and social structures. Renovation and new construction would align with current residents and existing buildings. However, again critique arose against the city renewal approach, as it did provide qualitative housing, but left the quality of the neighborhood as a whole aside. This evolved into the first social perspective in the governmental approach towards the built environment. Not only should physical aspects (such as dwellings, public space and amenities) be addressed, but also socio-economic aspects should be taken on. Problems such as unemployment, debts, crime, and vandalism should be resolved.

Reconstruction WWII					Big city policy		Nationaal Programma Leefbaarheid & Veiligheid	
1950	1960	1970	1980	1990	2000	2010	2020	2030
		City renewal				No government involvement		
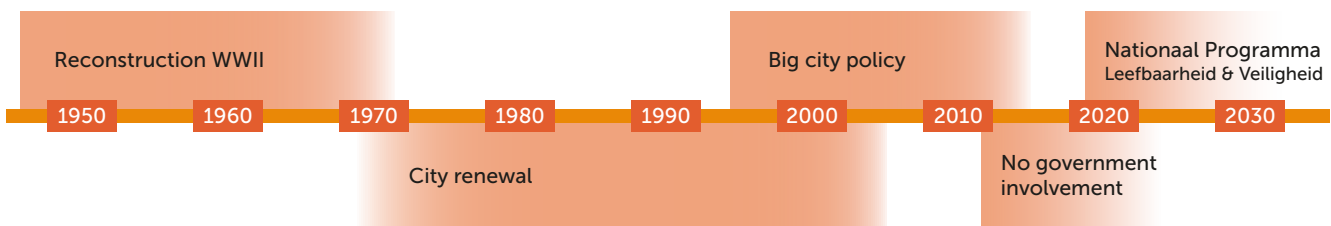
At this time, the biggest fear of a dichotomy in society found its base. The result is that policies had two focuses: 1) strengthening the economic position of the city and 2) diminishing or resolving the social deprivation of the cities. This resulted in a returning focus on neighborhoods and a population on the bottom end of the scale, a focus that was purposely left behind in the urban renewal period. On top of that, the government introduced in the 90s that they would shift from a national approach to a more locally and regionally directed approach. They said that the operation can now be picked up by corporations and municipalities to finish the job they started, while experts immediately argued that the financial load is still too high to cover the remaining city renewal projects. Specifically in the post-war neighborhood is the challenge a large one.

From the 90s onwards, the neighborhood approach gets adopted. The urban renewal policies aimed at a national approach, focussing on physical, economic and social factors. In practice, the policy is executed by focussing on the deprivation of so-called 'problematic neighborhoods' (aandachtwijken). The neighborhood approach becomes more dominant. In 2003, the sitting minister of VROM (Housing, Spatial Planning and the Environment) posted a list of 56 neighborhoods that were on the verge of collapsing (Uyterlinde, 2007). This was the start of decades of national programs for the revitalisation of problematic neighborhoods. In 2006, the list got replaced by one with 140 neighborhood that all dealt with socio-economic and physical deprivation. 40 of those neighborhoods became known as the Vogelaarswijken. They were part of a policy that enlarged the focus

on problematic neighborhood and it contributed to an increased focus on additional themes such as living, working, learning and growing up, safety and integration. Later on in 2009 en 2010, the list of neighborhoods received an additional 37 neighborhoods, because it was thought that the first list focussed too much on the Randstad. 1 billion euros were invested in the neighborhoods, but without result. Already after 4 years the program and financing were cut short, while the project should have lasted 10 years. This is largely due to the economic crisis of 2008, which resulted in large financial consequences for the housing corporations that should have played a big role in urban renewal. In the period from 2012 until 2019, there is hardly any focus on the deprived neighborhoods, because of the lack of national wide control. Local parties are struggling to find ways to work on the deprived neighborhoods, while the problems are becoming bigger and bigger. There are a few exceptions. The National Program Rotterdam South aims at creating a healthy future for Rotterdam South and focuses on 7 areas. It aims at catching up by focussing on the topics of living, education, and work. Other projects focussing on the deprived neighborhoods without national aid are often small-scale on a very local level in collaboration with local residents. In most cases, they do not intervene in the physical domain. In 2019, the government announced their re-entry in the approach of the depriving neighborhoods, with a national plan for liveability and safety (J. van der Velden, 2022). The program aims at an integrated approach in both a social as well as a physical domain. It focuses on 1) improving the physical living environment, 2) providing a better future perspective for residents, and 3) improving overall safety (Ministerie van BZK, 2022). The program states that only by working on the synergies between these three aspects will structural improvement be achieved. The program puts focus on 20 urban areas, being a district or a neighborhood.

Year	Number	Program
2000	643	Nota 'Mensen, Wensen, Wonen' - VROM
2003	56	Stedelijke Vernieuwing Winsemius - VROM
2007	140	Vogelaarswijken - Minister WonenWijkenIntegratie
2010	37	40-plus wijken - VROM
2016	12	Platfrom31 wijken
2022	20	Urban focus areas - RVO

4. POST-WAR NEIGHBORHOODS

4. POST-WAR NEIGHBORHOODS

During the period of reconstruction right after the Second World War, The Netherlands was dealing with a damaged country and an enormous housing shortage. The result is the realisation of large-scale city expansions and high housing production to deal with these issues. The neighborhoods that were realized are based on the principles of light, air and space and on community living. The high production number was achieved by developing new systematic construction methods for building medium-high apartment buildings. The fact that housing was constructed vertically meant that there was a lot of space for open, light and green spaces that would create qualitative and attractive living spaces. Streets were wide, infrastructure was broad and the focus was on car accessibility and public transport networks. While this idea was a perfect outcome at the time, quickly it became apparent that there was too much focus on quantity, not on quality. This lead to deprived neighborhoods for the most vulnerable target group. These places are now in dire need of structural transformation.

4.1 History

The post-war neighborhood typology covers the period from 1945 until 1970. This period is defined as the reconstruction period that followed after the world war. It is also a period of time depicted by renewal and innovation within urbanism, in terms of allotment patterns, new ideas of communal living, and an important role for mobility defining planning principles (A. Blom, 2004). This reformation finds its foundations already before the war when the housing law from that time was argued. A report was set up that argued that urbanism and urban planning should come before public housing because there should first be a proper location where housing can be rolled out. The report that asked for a national plan that covers the whole of The Netherlands was submitted fourteen days before the start of the war, and therefore never discussed. The idea that land is completely planned beforehand and should therefore come before the construction of housing was quite different from the prewar ideas. In 1958, the first concept of this idea was published; the spatial planning for the Randstad. Two years later, there was the First Nota of Spatial Planning, a document now well-known for urban planning in The Netherlands. After the Second World War, The Netherlands was dealing with two main issues; 1) recovery and growth of the economy and 2) catching up with public housing. Quickly it became apparent that the focus was on the amount of realized homes, therefore becoming a quantitative issue instead of a qualitative issue. The postwar era is the first time that spatial plans were based on scientific research, surveys or mobility prognoses. The expansion plans aimed at finding the relationship between social, economic, and demographic development and the usage of space for living, working, recreation, mobility and other amenities. They are the first integral plans that covered all aspects of the living environment and they determined the following:

Location and size of (new) neighborhoods

Demand and location of industry

Infrastructure and connections between old and new districts.

These plans were very detailed and clear, compared to later plans. They present a clear urban concept and are concrete in the envisioned neighborhood. Urbanist and architects could implement their idea of what the city is very well. At that time, designers opposed to the mass-scale of the city and proposed that we should live more according to the so-called 'wijkgedachte'. A. Bos explains in his book ''De stad der toekomst, de toekomst der stad'' what it entails. (1946). It means that community building is the leading aspect of spatial planning. For instance, the size of a neighborhood was based on the reach of a school. The number of people that use the school decided the size of a neighborhood. Other amenities such as shops and churches were realised in the centre of this scope. The so-called 'Gelegde Stad' by W.F. Geyl is the Dutch base for the wijkgedachte. A hierarchy in city expansion sets the base, in which the city centre is in the middle, with all the new neighborhoods surrounding it. These were divided by roads and greenery to make a balanced whole. The hierarchy of the city started at the city centre, after that comes the city districts, the city quarter, the neighborhoods and lastly the dwelling. The strict function division is also a result of this idea.

The very first implemented experiment on this new idea of urbanism was a design voor Moerwijk in The Hague by Dudok in 1948. H.P. Berlage made the first design for Moerwijk before the world war, but only small parts of it were realized. His design was based on a closed block with a focus on squares and canals. Diagonal and curling streets alternate the rhythm of the orthogonal grid. Dudok broke with the design by Berlage by introducing an open block, made up of parallel strip buildings with occasionally a smaller perpendicular block at the end of it. The neighborhoods were also built around a small centre with amenities. Moerwijk became the first example of the implementation of the wijkgedachte. The setup of the neighborhood is constructed by living units (wooneenheid). This is a collection of housing blocks with a clear and often similar orientation optimised for ideal lighting. In the publication 'Woonmogelijkheden in het Nieuwe Rotterdam' the living unit was further elaborated. It consists of a collection of building blocks located around an open area that consisted of roughly 90 dwellings. This would be the ideal format for qualitative community living in a fair and just living environment.
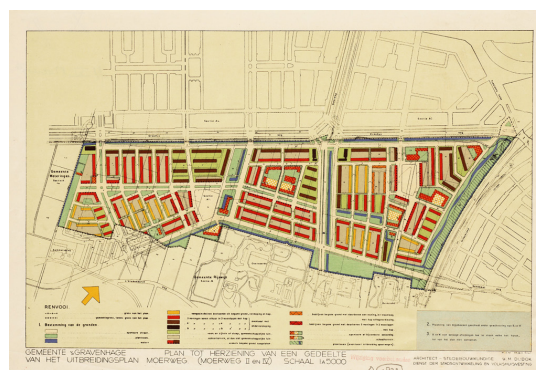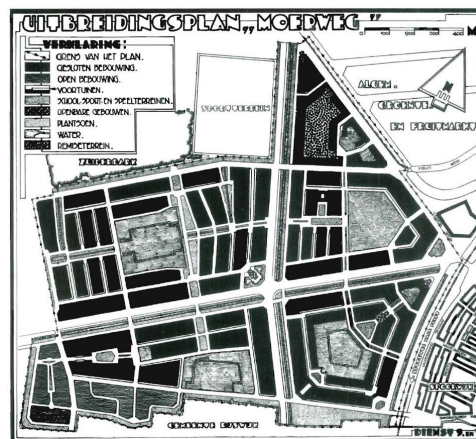
The implementation of systemic construction and the fact that these urban expansion districts were often realized on a polder structure led to the strictly orthogonal grid, with long axes. These axes were used for infrastructure to ensure proper connectivity for vehicular flows or for lines of greenery that connected one park to the next. Along the bigger infrastructural axis, no dwellings were realised, because these places would not create qualitative living conditions. This creates a dominant image of roads and streets throughout the districts with a clear hierarchy of through roads, access streets, living streets and walk and cycle paths. The housing corporations at that time were big stakeholders in the realisation of dwellings because they have to provide housing for all. The clear structure and zoning are visualised in the image below, with an example of Kanaleneiland in Utrecht and Morgenstond in The Hague.
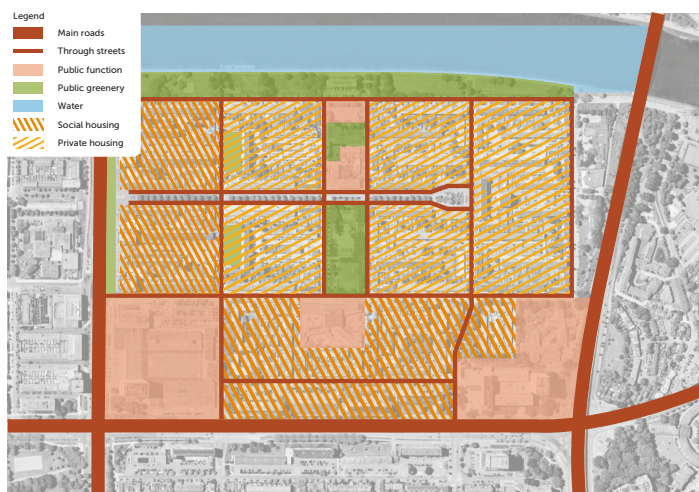
4.2 Design Characteristics

In the post-war period from 1945 until 1965, 2 million dwellings were realised. The post-war neighborhood typology is very recognizable due to the ideologies behind the design and because of the large number of productions in a relatively short period of time. The strictly orthogonal grid and linearity can be clearly distinguished from all time periods, as can be seen on the image on the right page. There are a number of characteristics that make the post-war neighborhood typology very recognizable.

The first one is the allotment typology. The newly introduced systemic construction gave way for strip building of 3, 4 or 5 levels high. Instead of the closed-off allotment, more open typologies came up, providing more light and air. More and more variations from the basic strip design evolved, for instance, L-shaped allotments and later on the stamp. The allotment was used as a repetitive element that constructed the urban plan. The latest post-war typology implemented high-rise buildings, which made it possible to have an almost completely open field in which the buildings would be freely placed.

ALOTMENT TYPOLOGIES

closed-off   cut-open   strips   courtyard

stamp   mirrored   free-shape

TRAFFIC MODELS

vehicular traffic

car n'hood   seperation   superior network
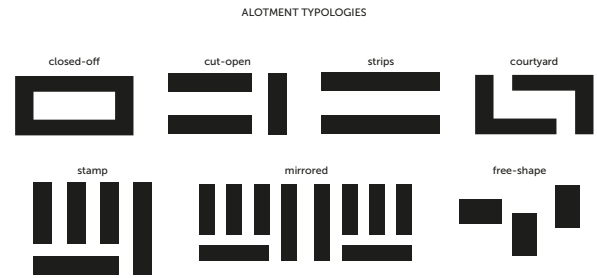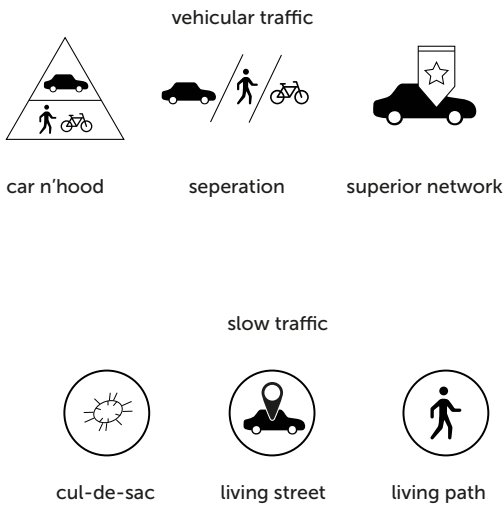
The second element is the traffic model. There is a strict hierarchy in which the car is dominant, but often the traffic flows are clearly separated to create safe traffic conditions. Besides that, infrastructure was optimised for car use. Because the car could reach almost anywhere, streets did serve different purposes. Cul-de-sac made dwellings accessible but stopped through traffic while living streets slow traffic down in favour of cyclists and pedestrians. Living paths provided connections that are only accessible on foot.

slow traffic

cul-de-sac   living street   living path

The last recognizable element is the urban model. The post-war typology uses an orthogonal grid with an inner or outer access road. Along one main axis or a cross axis through the centre of the neighborhood, lie public, civic and commercial functions. The location of these functions often in the centre also led to a centric design of the infrastructure. In later models, a more village-like pattern was used that tried to mimic the organic sprawl and randomized orientation.

URBAN MODELS

grid   circular outer/inner   linear

cross axis   cenrtic   traditional/modern village
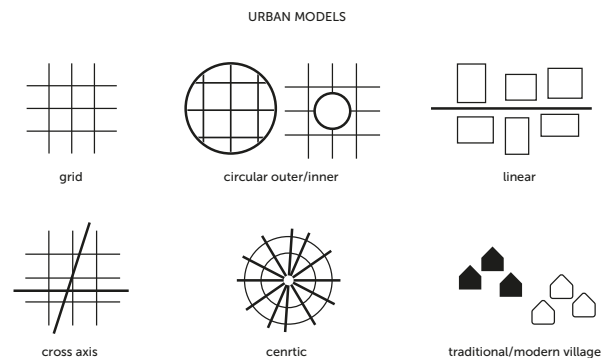
before 1930

Urban block

1900-1940

Prewar block

1910-1930

Garden city

1945-1955

Postwar garden
city low

1950-1960

Postwar garden
city high
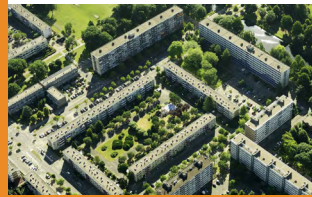
1975-1980

Postwar
neighborhood

1940-1990

Cauliflower
neighborhood

1990-2005

Highrise city
center

1960-now

Suburban extension

RDAM Overschie
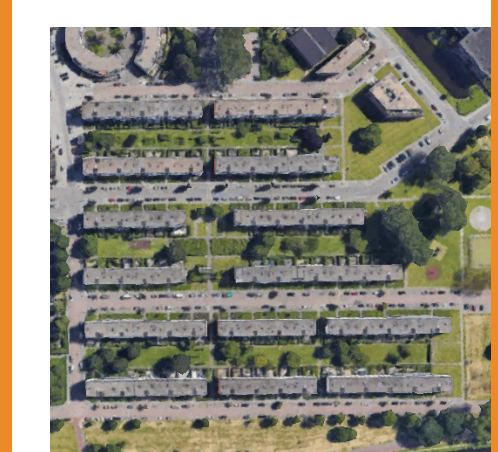
Parallel strips

DH Moerwijk
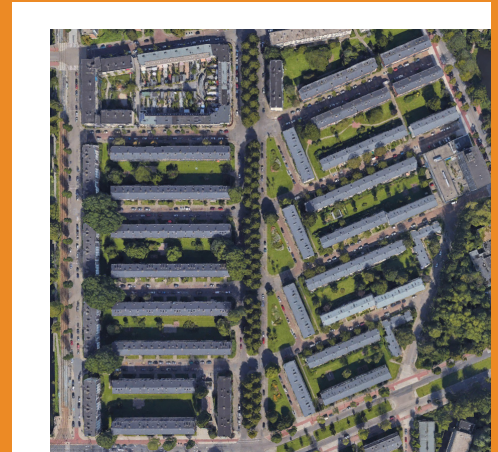
Strip and head

AMS Buitenveldert
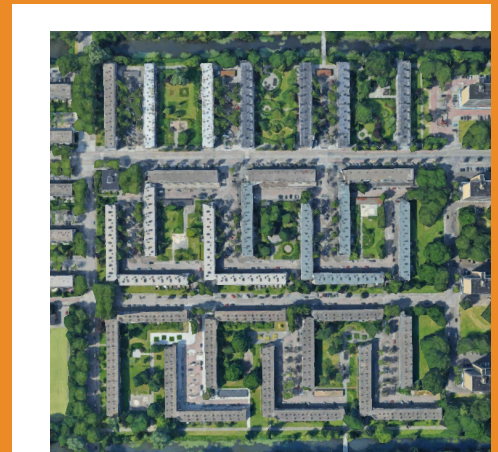
Stamp

4.3 Spatial Identity

The Dutch Bureau of spatial planning executed a study on the problematic neighborhoods listed by Minister Vogelaar (Lörzing et. al, 2008). The aim of the study was to gain a better understanding of the neighborhoods that dealt with liveability issues. They analysed multiple neighborhood typologies throughout different periods of time on their spatial characters, and identities. There are three categories that are of interest for this research: 1) homogenous, 2) heterogenous, and 3) mega structures. All of these categories date back to the post-war era between 1945 and 1975.

Homogenous
The early post-war era showed a clear homogenous typology of a strip design. Low highrise building blocks were organised in a strip layout with fields of green in between the blocks. The repetitive character is very strong here, which leads to anonymous spaces and a dull identity. The repetition and continuity of the strip into the urban fabric results in a strict homogenous pattern of street - strip building - courtyard - strip building - street. Because this typology is early post-war, in some cases the morphology created a deviation in the grid, after which the grid undisturbed continues.

Heterogenous
The later post-war era tried to break with the homogeneity by introducing a stamp design. A stamp is a collection of building blocks with alternating orientations on green fields, often without streets in between them. This creates large calm spaces of green fields flowing through the collection of blocks. The alternating orientation of streets and buildings should have brought intriguing and complex open spaces, but because the stamp was again endlessly repeated it gave still an anonymous identity.

Megastructures
During the 70s, construction could reach much more heights which resulted in high-rise gallery flats, also referred to as megastructures. The most iconic design is the Bijlmer in Amsterdam. The design aimed at realizing dwelling in a vertical line, in order to free up as much of the open field. In this way, residents live in a park-like surrounding with huge amounts of green open space. However, these spaces actually gave a feeling of social unsafety, because they seemed fast spaces of no-mans land. The strength of the high-rise building is their landmark identity, they help in recognition and orientation when moving through the neighborhood.

The three typologies share some similarities. One of these is the use of open green spaces in between and around the building blocks. The idea was that while dwellings were vertically stacked, residents would still have access to green outdoor spaces. Although these spaces are publically accessible, they were designed collectively for the adjacent residents. However, the connection from the dwelling to the courtyards is a lot weaker than the connection from public to the courtyards, which leads to unwanted visitors and unpleasant activities. In many cases, fencing is placed on the border of public and courtyard to protect the collectiveness. This pattern of collective spaces with a public character is still an unresolved issue in many locations. Another aspect that all typologies share is repetition. Repetition was key to constructing large amounts of dwellings in times of housing shortage after the world war. The newly developed systemic construction provided the possibility to repeat a building block over and over, thus speeding up urban development. The homogenous pattern that resulted from this has a strong anonymous character, as everything looks similar and there are few elements of recognition and orientation. The stamp tried to break with it by alternating the orientation of buildings and creating more complex open spaces. This worked on a low level, but the stamp then again was repeatedly implemented, coming to the same conclusion of anonymity. With the mega structures, it seemed easier to limit repetition, because of the sheer size of the building block and the borderless identity of the outdoor space. However, Bijlmer showed that repetition can also be realised on a large scale. Here, the aspects of anonymity occur on a building scale as well as on an urban scale. The last shared aspect touches upon both of the first two. While the open spaces were designed for the residents, the connection between the dwellings and the outdoor space is very weak, due to closed plinths and the first-floor apartments located half a level above the plain field. In combination with the plain design of the courtyards, there is limited activity going on in the courtyards, and they function more as visible green spaces rather than qualitative usable outdoor spaces.
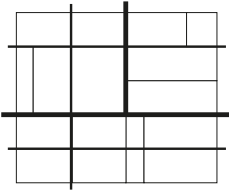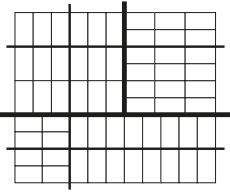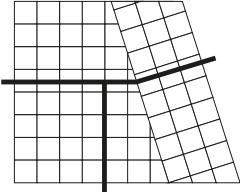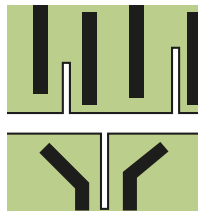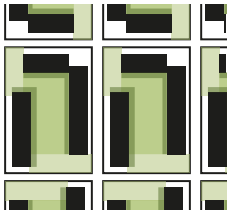
URBAN FABRIC

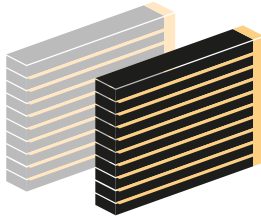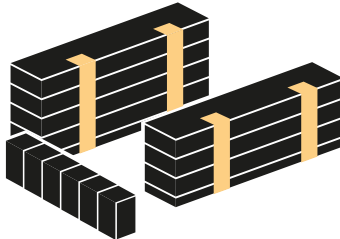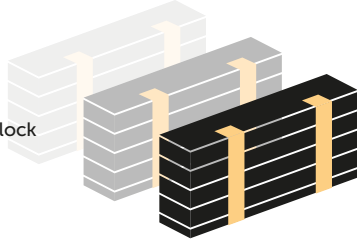|	early p.w. **homogene**	later p.w. **heterogene**	last p.w. period **mega structures**
grid			
alotment			
block			

grid / **alotment** / **block** diagrams for the three categories
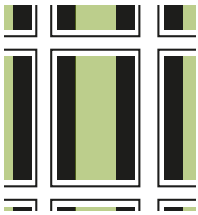
AMS Bos en Lommer
AMS Osdorp
DH Morgenstond
DH Moerwijk
RDAM Zuidwijk
RDAM Welschen

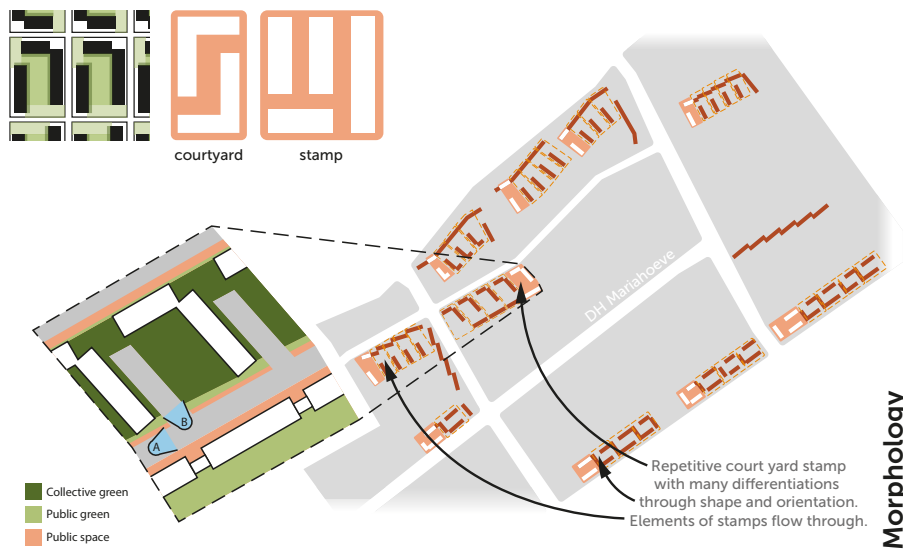RDAM Pendrecht
AMS Buitenveldert
AMS Osdorp
GRO Vinkhuizen
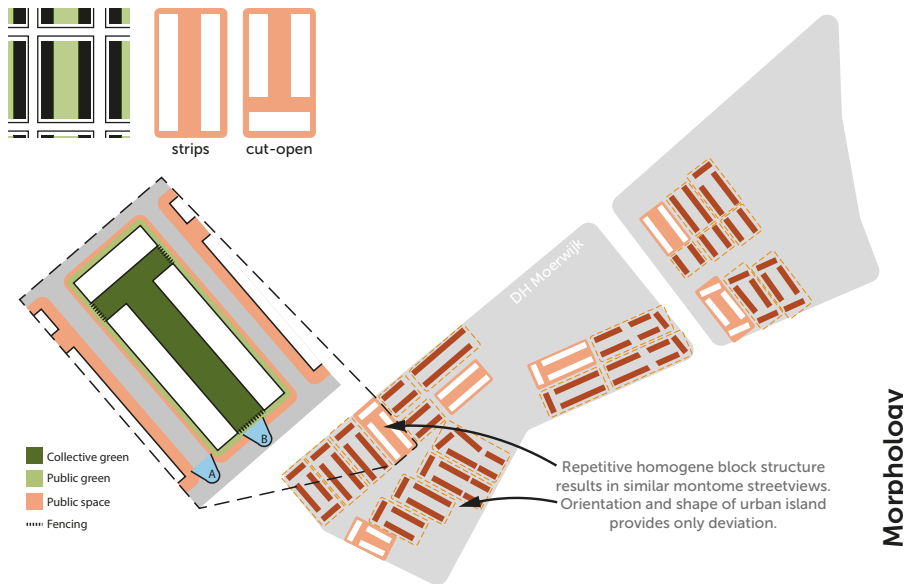
AMS Molenwijk
AMS Bijlmer
RDAM Ommoord
DLF Poptahof

Den Haag Morgenstond

Rotterdam Pendrecht

Amsterdam Bijlmer

courtyard   stamp

Collective green
Public green
Public space

Repetitive court yard stamp with many differentiations through shape and orientation. Elements of stamps flow through.

DH Mariahoeve

strips   cut-open

Collective green
Public green
Public space
Fencing

Repetitive homogene block structure results in similar montome streetviews. Orientation and shape of urban island provides only deviation.

DH Moerwijk

free-shape

Parking area
Public green
Public space
Railway

Enormous plane of green public space with free standing towers. Repetitive buildingblock structure and connection through big roads and endless footpaths.

AM Bijlmer

Streetscape

A

Access street
Entrances towards street
Wide street profile
Alternating views
Parking along street
Free standing garages

B

Court yards
Fast green outdoor space
Outdoor space open to street
Divided accesibility from dwellings
Collective parking
Good visibility on outdoor space

Streetscape

A

Living street
Buildings wrapped in green
Entrances towards street
Pressure on parking
Wide street profile

B

Collective gardens
Buildings wrapped in green
Large residential outdoor space
Inaccessibility from dwellings
Fence for collectiveness
Non functional greenery

Streetscape

A

Parking street
Large clustered parking
Highrise galery flats
Big structures
Big contrast park and parking

B

Public park
Enormous open green space
Free standing buildings
Park design
Loss of human scale

The three typologies have been analysed on the previous page. The most important findings have been listed in a SWOT analysis on this page. In terms of threats and weaknesses, collectiveness and car dominancy come forward. The bleary borders between the public and the collective lead to unpleasant visitors and unwanted activities. The result is fencing to accentuate these borders, weakening the open and natural character of these courtyards. The car-dominant design of the streets creates a threat of vehicular pressure and makes cycling and walking less attractive. The car-oriented street profiles that result from this consist of a hard and logistical character that are in great contrast to the natural and calming courtyards.

The biggest strength of the post-war neighborhood typology is evidently the courtyards and fast green outdoor space. They are very valuable, as not many urban areas have such amounts of high-density greenery. It must be said that the quality of the spaces has a lot of room for improvement, but the fact that they are present is a huge advantage. The building typology is also one of the strengths. The most occurring typology is the portico flat. This is an apartment building which decentralized stairways. They access two dwellings on either side of it for each level. Although these stair cores limit accessibility due to the absence of an elevator, socially they work quite well. The stair core is shared with a small number of dwellings, creating the possibility to get to know the neighbors because they share a common space that can make them feel part of a group. The stair cores have a good connection to the street, often with a small green zone bordering the building and the street. In some cases, the stair core opens up to the courtyards or has an entrance on both sides of the building. This creates good connectivity and boosts social interaction between the residents.

Still, the amount of space that hosts social interaction is minimal. The courtyard is a great place for social interaction, however, its connectivity, accessibility, and minimal design do not substantiate this goal yet. In addition, the orientation and composition of strip buildings around a courtyard often have a sheltering effect on the space, which can create a safe and controllable space. Unfortunately, the bleary borders between the public street and collective courtyard negatively impact this character. However, it is not always the border between collective and private that limits social control, it is also the size. The green outdoor spaces are sometimes so big that social control is not possible. It might be more effective if there is less open space with better quality, rather than huge amounts of functionless open space.

	Strength	Weakness	Opportunity	Threat
Homogenous	Interactive entrance towards street	Fenced-off collective yards	Communal outdoor meeting garden	Vehicular pressure
Heterogeneous	Direct connection entrances & garden	Car-oriented street profile	Sheltered collective courtyard	Bleary border public-collective
Mega structures	Green living environment	Uninviting hardness	Space for densification	Loss of human scale

...into the transformation of neighborhoods, with the goal to investigate how we can transform existing neighborhoods with respect to their urban identity (2008). Part of this investigation is research into the identities of multiple neighborhood typologies throughout different periods of time. Three typologies are of interest for this research: ...
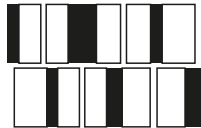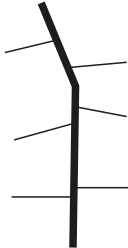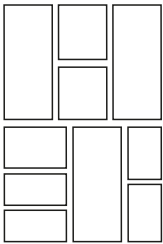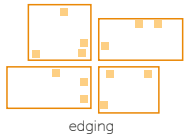
Boundaries	Infrastructure	Green and Blue	Functionality	Landmarks

Principle

rectangal

clarity

hiërarchy

division

equal distribution

partition

centrally

seperation

standardization

edging
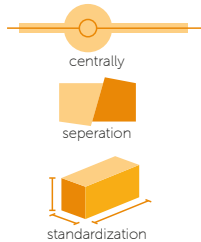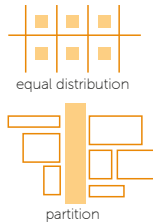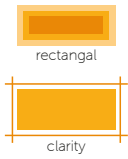
Implementation

4.4 Post-war Neighborhoods in The Netherlands

During the reconstruction period after the Second World War, an estimated 2 million dwellings were realised, accounting for 25% of the Dutch housing stock (van Meijel, 2001, Ministry of BZK, n.d.). The number of districts (wijken) that have the post-war typology varies by using different criteria. The result is that the number lies between 354 and 1.012 (Eichler, 2010). The average translates to 20% of all the Dutch districts (Allecijfers.nl, n.d.). The number of neighborhoods (buurten) is roughly 1.800, accounting for 14% if the overall amount (KAW, 2020, Allecijfers.nl, n.d.). The neighborhood typology can be found in and around cities throughout the whole of The Netherlands. Considering the overall amount, there is a point of gravity in the Randstad, simply because the density of cities is higher here. If we consider the average number of people per household, 2 million dwellings translates to 4,3 million people or 24% of the national population (CBS, 2022). A large part of the post-war dwellings are dedicated to social housing. It is estimated that there are 720.000 housing corporation dwellings dating back from the post-war era (KAW, 2020). As discussed before, the post-war neighborhood typology is out-dated and technically and spatially decaying (van Meijel, 2001). This fact was also proven by Minister Vogelaar in the report on the so-called 'krachtwijken', which was a list of 40 neighborhoods dealing with structural liveability issues. 28 out of the 40 neighborhoods originated from the post-war era (Lörzing, 2008). However, two decades after the publication, this trend can still be found in neighborhoods throughout The Netherlands. Estimations of the number of post-war neighborhoods that deal with liveability issues reach from 16% until 25% (CBS, 2017, Argiolu, 2008).
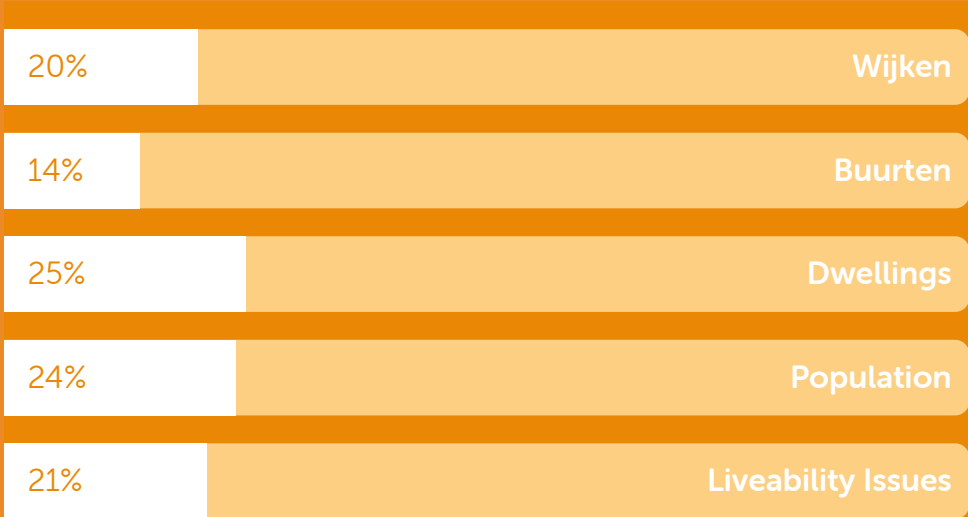

Amsterdam Geuzenveld (Amsterdamopdekaart.nl)

Arnhem Presikhaaf (Gelders Archief)

Dordrecht Crabbehof (Indebuurt Dordrecht)

Heerlen Meezenbroek (Historisch Centrum Limburg)

20%	Wijken
14%	Buurten
25%	Dwellings
24%	Population
21%	Liveability Issues

4.5 Transformation

Since Minister Vogelaar published about the 40 'prachtwijken', a lot of attention was pointed on the post-war neighborhood typology. Especially a lot of critique arose, because the restructuring plans that were already realized overlooked the great potential of the post-war urban fabric and instead replaced with standardized housing solutions (Bijlsma, 2008). This new attention for the post-war neighborhood typology formed the base for many spatial and characteristic analysis of this typology, looking at what the identity, quality, and problem are. The next step was made by the Dutch National Bureau for Planning (2008). They looked at what the potential of the urban fabric is and how it can be integrally transformed without losing the urban qualities. The governmental plans lead to this research, because they aimed at realizing 25-40% of the new housing in the existing built environment (Ministrie van AZ, 2007). The research looked at all kinds of typology, of which the post-war era was one of those. For the transformation, there are three categories (Bijlsma, 2008):

1.	Redevelopment: this is the least radical intervention at it deals with the transformation of collective and public spaces in a neighborhood. This can, for instance, be done through a new street profile, new street furniture or additional landscaping.

2.	Reuse: a more radical approach in physical intervention. By reusing the existing buildings, new housing typologies can be created by splitting or combining existing dwellings. The outdoor space can also be reused by reconfigurating collective gardens into private and public parts.

3.	Reconstruction: this is the most radical approach and deals with demolition and new construction. This method does not utilize the existing urban fabric. Instead, it demolishes the existing situation and replaces it by a completely new type of residential area, in compliance with current urban ideologies.

The publication provides as set of transformation guideline for the post-war typology. These are ways of transformation that utilize the potential and strengths of the existing urban fabric.

Neighborhood level

The post-war identity is characterized by a rhythm of open green space and building blocks. The ensembles can be replaced by comparable open or newly-introduced closed blocks. Creating completely closed streetwalls will harm the open character, therefore this is not preferable. The allotment can be enlarged or reduced, increasing the size of small blocks or breaking up long-stretched blocks. Where possible, open space can be densified to create new buildings typologies and further diversify. Another option is redesigning these open spaces to creates more attractive and qualitative outdoor space. Another identity building aspects are the spacious greenery and infrastructural structures. Here, there is the possibility to densify these structures, or reuse and redesign these spaces. Incidental addition of new buildings should follow the rhythm of open spaces and building blocks.

Ensemble level

On a smaller level, it is also possible to reuse or redevelop the green open spaces. Here, densification that follows the existing rhythm can be applicable. The design of open spaces can be reconfigurated to collective courtyards or even give parts to dwelling and create private gardens. This can be an impuls for an increase in use of the green spaces. The activation of the outdoor space positively contributes to an improved liveability. The building blocks itself can be extented on sides with blind facades, or blocks can be vertically extented with a top-up layer. The parking situation should be integrally designed in order to cope with the additional parking pressure. The last resort is to demolish the buildings and replace them by new construction.
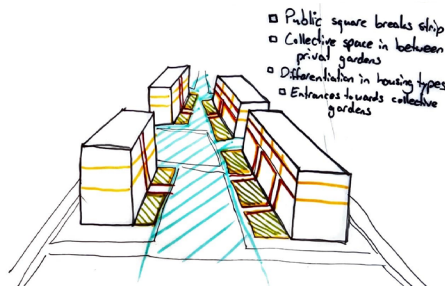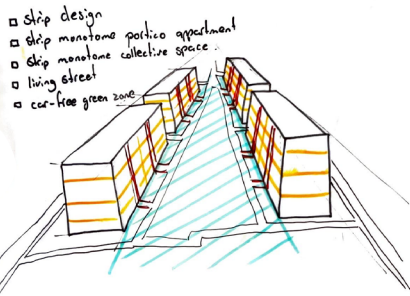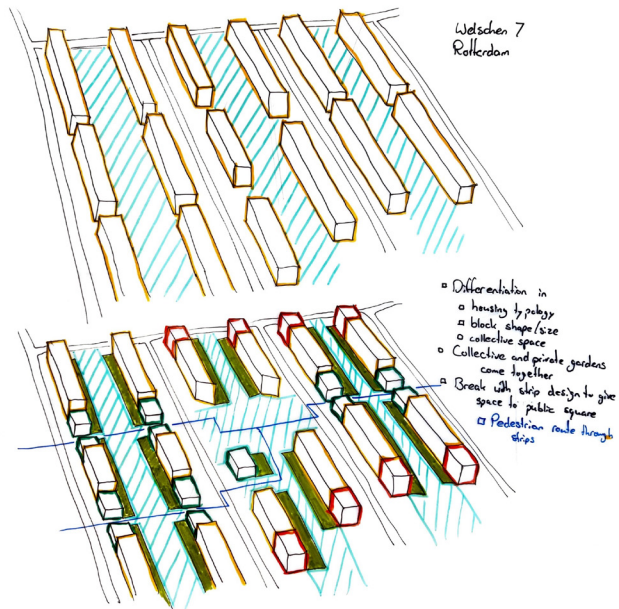
Building level

The construction of the buildings are quite flexibel. Therefore, it is feasable to introduce new housing typologies, create new entrances or improve the accessibility of the dwellings. Long building blocks can be cut up into smaller ones, dwellings can be put together to create maisonettes, and the ground floors can be opened up by introducing dwellings, communal spaces or public functions. New housing typologies can also be introduced by occassionally additions onto existing building blocks or on open space in between existing blocks.

Since the period of city renewal in the 90s, post-war neighborhoods have already been subject or redevelopment (Bijlsma, 2008). Therefore, there are already a lot of examples of reconstruction, ranging from radical full demolition and new construction until small scale intervention in combination with renovation. A selection of case studies will now be analysed to learn from the different kind of interventions that have been implemented, their success and their impact on the quality of the living environment.

Welschen, Rotterdam

The neighborhood of Welschen in the area Overschie in the north of Rotterdam was one of the very first post-war neighborhood to undergo transformation in the early 90s, only 40 years after its realization (Moscoviter, 2007).

5. DENSIFICATION FRAMEWORK

5. DENSIFICATION FRAMEWORK

So far, this research dived into the concept of liveability. It investigated what the definition is and what it means in the context of the built environment. After that, the concept of the compact city and the strategy of densification have been analysed. Lastly, the post-war neighborhood typology has been analysed with its challenges and its potential. This chapter aims at concluding the findings of each part of the research. Afterwards, an attempt will be done on bringing together the findings of liveability in the context of densification. Now, the main question will be answered. The next step is to transfer the theoretical conclusion into a design proposal. What do the conclusion contribute to the practice of designing a transformation and densification project. A densification framework will set the goals and guidelines for such a project, after which the design proposal will provide design principles and intervention. The principles and interventions will be of example for future densification projects. In the end, a reflection on the process of this research will be executed.

5.1 Conclusions Research

This research set out to find a solution for the two biggest crises at moment in The Netherlands. The first is the housing crisis consisting of an enormous housing shortage, an inbalance in demand and supply, and an outdated and underperforming housing stock. The other crisis is the liveability crisis that deals with neighborhoods coping with a consistent pressure on the physical and socio-economic situation, a large vulnerable group of the population that is stuck in unliveable conditions and an increasing spatial injustice due to the growing gap between the good and bad neighborhoods. While liveability issues are often trying to be resolved through social participation programs focusing on education, criminality and unemployment, the instrument of densification could have the potential to change the spatial characteristics and, at the same time, function as a catalyst to upgrade the liveability. By answering a set of research questions, this research tries to prove this hypothesis.
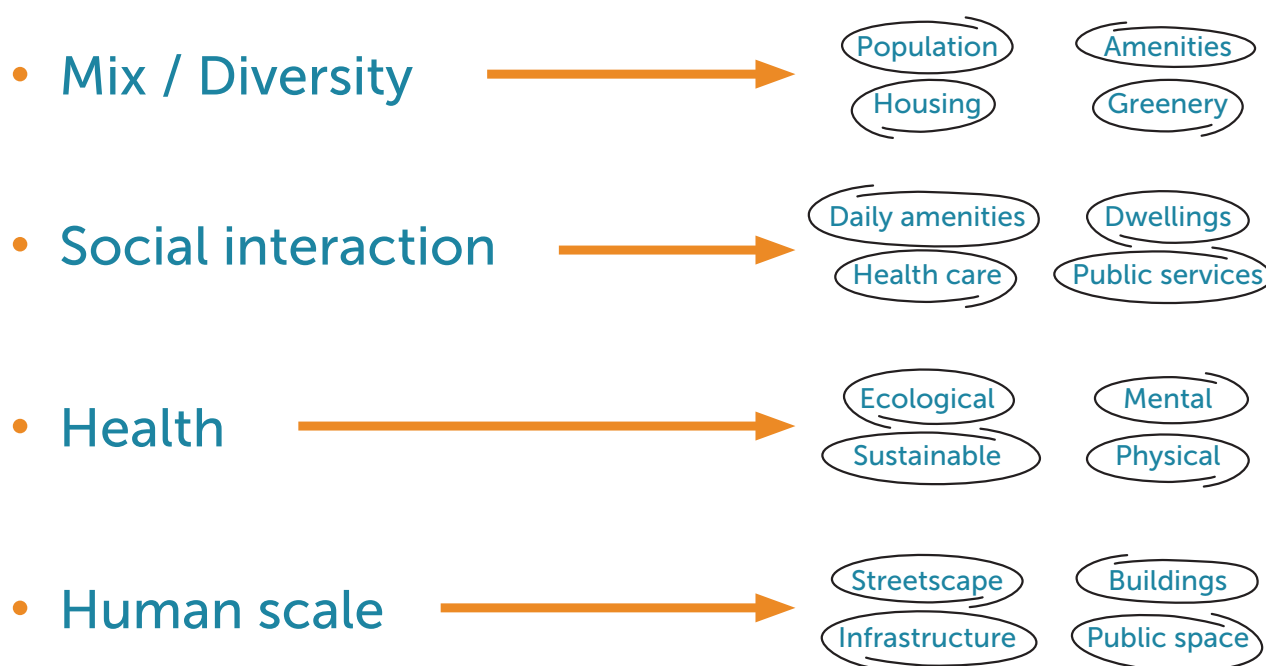
Liveability
The first step is to get a better understanding of what liveability is. Throughout literacy, the definition of liveability is the mutual relationship between an object and its surrounding, also referred to a the apparant liveability. This means how suitable an environment is for an individual to live in and how fitting the individual is for this environment. Although this definition is scientifically the most fitting one, it is one of many different interpretations of the concept of liveability. The stated definition is one that is really difficult to put into practice, because it is not a tangible thing. Therefore, practice implements two definitions, one from the perspective of the surrounding and one from the perspective of the individual, referred to as the supposed liveability and the perceived liveability. How suitable an environment could be to an individual (supposed liveability) is something that can be measured using data analysis of aspects of the built environment. However, in order to find out whether individuals genuinly perceive an environment as liveable (perceived liveability) a survey or questionnaire has to be used. Measuring liveability through data can only be used to make a calculated guess of what places struggle with what aspect of the built environment. A local survey can then indicate where the issues lie and what the local residents are seeking in that specific environment. The aspects of the built environment that determine the state of liveability can be categorized in five themes:
1. Physical Built Environment
2. Housing Stock
3. Social Cohesion
4. Amenities
5. Unsafety & Nuisance

From bottom to top, the themes have a higher influence on the level of liveability. Although it is known what aspects of the built environment relate to liveability, the relationship is not causal. This means that if an aspects scores bad, an improvement in the field of that aspects does not nessecarily mean an increase in the level of liveability. This shows the complexity of the concept and the correlation between all the aspects of liveability.

However, experience can be a helping hand in understanding what intervention can have a positive impact on liveability. Diversity is one of the topics that comes back in many cases. It appears that monotomy has a big impact on liveability. Monotomy can be found in every aspect of the built environment, for example in population, housing typologies, architecture, amenities, public space, social programming, greenery, streetscapes, etc. Diversity contributes to recognition of place, feeling of belonging and accessbility for all. Creating a diverse and mixed city creates a an intruiging, interesting and attractive living environment suitable for everyone. The second element that is key to liveability is the social factor, specifically social interaction. The amount, frequency and quality of social interaction plays part of a person's well-being, the feeling of safety and the sense of belonging, and thus the level of liveability. Knowing the people that live around you and being part of a community is vital to a good living environment where people feel safe and at home. A liveable environment is also a healthy environment, intoducing the third element. Again, health concerns many different topics, such as mental health, personal physical health, ecological health, environmental health and healthy mobility. It is a broad spectrum but it all comes together at the individual and sustainability. For instance, the reduction of

- ## Mix / Diversity →

  (Population)   (Amenities)
  (Housing)   (Greenery)

- ## Social interaction →

  (Daily amenities)   (Dwellings)
  (Health care)   (Public services)

- ## Health →

  (Ecological)   (Mental)
  (Sustainable)   (Physical)

- ## Human scale →

  (Streetscape)   (Buildings)
  (Infrastructure)   (Public space)

vehicular traffic and the promotion of public transport and active modes of transport contribute to less gas house emission and air pollution, which is good for the environment, for ecology, and for people's health. On top of that, less vehicular flows create safer streets and promoting cycling and improving walkability helps in terms of personal health. The last key element to liveability is the human scale. Human are in the centre when it comes to our built environment, therefore the built environment should be constructed to the size and scale of humans. The human scale contributes to the idea of a sense of beloning and ownership. If a place is too big, nobody will feel attached to it, while taking ownership of a place and making it your own is an important step in creating a liveable environment. The human scale must be implemented in the streetscape, the shape and size of the building block, in the proximity to amenities, in the connectivity for cyclists and walkability, and the size and volume of public space. A liveable surrounding is a living environment designed for humans.

Densification

The next step is to prove the relationship between liveability and densification. In order to do so, research has been done on the the compact city and densification. The densification of a city will lead to a more compact city and this has certain advantages. A compact city limits the use of land, specifically unbuilt land. In this way, it can preserve precious natural and agricultural land and instead reuse the existing built environment. This again is a sustainable approach to urban development. A compact form is also beneficial in terms of a thriving economy, energy efficiency, and supporting urban amenities. In addition, the compact city can limit polluting vehicular flows and instead boost active mobility and public transport. The rich history of densification in The Netherlands proves that this is not a new approach and the example present us with different ways of densifying as well as evidence of its effect. An interesting find is that densification in terms of increasing the local population can have a positive effect to the local liveability. The projects analysed by the Board of National Advisors all received positive feedback. The increase of inhabitants brought more business and therefore more liveliness. All the projects combined the addition of homes and inhabitants with certain functions and amenities. These were nor only shops and stores, but also healthcare facilities, childcare centre, cultural functions and a community centre. The strategy of densification was a way to stimulate and boost the social programming that the residents seeked. Adding these kind of function alone would not make it financially and economically feasable as there is too little demand for them too survive. The addition of dwellings next to the existing stock also makes it possible

Densification means the **increase** of the **density** e.g. dwellings, residents or amenities.

Densification means **adding** on to the **existing** situation. Adding diversity, opportunity and resilience.

Densification has the ability to add **quality** to the living environment.

to introduce new housing typologies, someting that is also key to higher liveability rates. Instead of transforming the existing stock, the existing housing typologies can stay and the missing typologies can be added. This is a resilient approach as it preserves the homes of people who have a fitting home and at the same time provide new homes for people who want to move. This again opens up the opportunity for people to move into the housing that becomes available in the existing stock. Now, people are finally able to make a step in their housing career that would before not be possible.

Densification evidently has the ability to add something to the existing urban environment. Instead of getting rid of the existing situation and replacing it by something that is more preferable, the tool of densification has the power to work with the existing situation and add on the missing elements. As explained, inhabitants, dwellings and amenities can be added, therefore diversity can be added which again leads to more opportunity and resilience. Implementing the instrument of densification in a redevelopment strategy is a way to add quality to a places that was before struggling with providing a qualitative living environment.
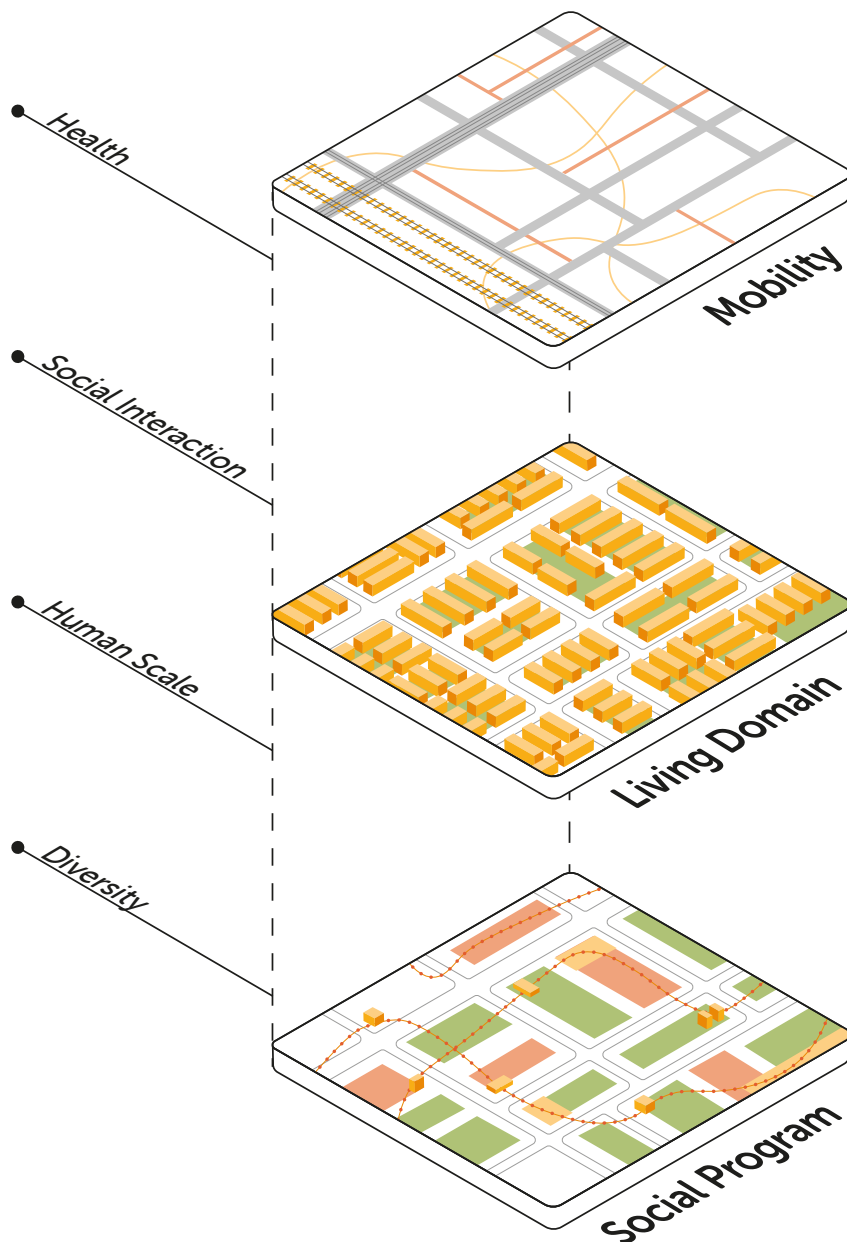
Densification framework
In addition, densification should never be a goal in itself. While the instrument of densification and the result of the compact city both have clear and valuable benefits, the wrong implementation could bring up solely the negative side effects. In that case, densification can lead to congestion, loss of human scale and decreasing social cohesion. It might look simple, but only a smart and integral strategy and design can benefit from the advantages and be of benefit to the existing environment. This is way it is crucial to create a framework that guides a redevelopment strategy that implements densification to make sure that it contributes positively to the existing urban context. Key to this framework is the fact that densification does not only mean the addition of homes or buildings. It goes hand in hand with transformations in mobility, greenery and social programming. Take for instance car use. If an area is densified in terms of housing with a factor of 2, twice as many cars need to access and be parked in the existing urban environment. This leads to traffic and parking congestion. A solution could be to widen the roads and construct parking garages, however this will negatively effect the level of liveability. An alternative solution that simultaneously positively contributes to the level of liveability would be to stimulate active modes of mobility, such as walking, cycling and the use of public transport. The point here is that when densification of dwellings is being executed, a transformation of the existing infrastructure network or mobility approach must be considered. The reason that this is nessecary is to be able to benefit from the advantages of a compact city. But at the same time, this goal can be translated to benefit the level of liveability as well, because there is an overlap between these goals. This can be made visible in a complexity diagram as shown on the right page.

A hand-drawn concept map. Key nodes and connections:

Densification branches to:
- **Increase # of dwellings**
- **Increase # of inhabitants**

From **Increase # of dwellings**:
- Higher density in existing buildings → More activity + usage of common services → Opportunity for social interaction
- Addition of new building block → Opportunity to change urban form → Create better public & private spaces → Identity of Light, Air, Space
- Need for more parking for cars/bikes
- Change of street character

From **Increase # of inhabitants**:
- More demand for amenities → Chance to boost local business / Create work opportunity
- More demand on infrastructure → Optimize public transport network / prioritize slow traffic network / minimize car network / Improve walkability & bike-connectivity
- More demand for sports & recreation → Introduce and enhance sports facilities and cultural programming / more demand for education → Combined schools for all ages

Central cluster:
- local and circular economy by and for its residents
- promote electric and shared mobility
- pressure on preservation green & blue network
- Shared mobility, Landscaping shade, Repair room
- Safe streets, Permable pavement, Flooding zones, Car Park

Lower clusters:
- Walkability cyclability, Climate resilience, Open/light ground floor, Gradual highrise, Lively streets, Safe communal gardens, Accessible gardens, Closed blue network, Green streets
- Washroom, Central entry, Bike storage, Shared facilities → Forced/Voluntary, Thee house, Vegetable garden, Community living room
- Measured to human size, view, mobility, sense of belonging, sense of safety
- Job/education, Ecological health, Knowing each other, Common interests
- Mental well-being, Physical health, Social Cohesion, Community
- Repair stores, Permable pavement, Recreation, Cultural, Daycare, Urban farm, Pool-park, High low education, Civil work, Sports, Park, Canal, Plants, Bushes, Shops, Dwellings, Schools, Offices
- Immigrants, Couples, Shared living, Students, Starters, Singles, Families, Elderly, Dutch/Foreign, Young, Old, Grass, Trees

Bottom goals (teal boxes):
- **Human Scale**
- **Health**
- **Social Interaction**
- **Diversity Mix**
- **Ecology**
- Housing, Population, Amenities

All connecting to **Liveability**

The densification framework proposes intervention on three levels:

1. Mobility: focuses on the hierarchy of different modes of transport, the design of the streetscapes, and accessibility of the neighborhood

2. Living domain: focuses on the addition of new building blocks, transformation of existing building blocks, and changing the urban fabric.

3. Social program. focuses on the balance between public and private space, the design of places of social interaction, and the implementation of new social functions.

The three levels are determined by the scope of densification. This means that although mobility might not seem like a densification tool, it must be designed with in order to benefit from the advantages of densification and thus diminish the negative consequences. The liveability guideline applies for all interventions and must contribute to any or all of the liveability goals: diversity, social interaction, health, and human scale. The liveability goals are in hierarchal order so that diversity comes first.

Densification design

What does this framework do for the design of a densification project. The framework indicates what aspects need be designed or redesigned that a crucial for a successful densification project that benefits from the advantages that come with densification.

It starts at the top level of mobility. The mobility network has to prioritize active modes of mobility as well as promote public transport. Therefore, a new hierarchy must be introduced that determines which traffic flows go where. Patterns of the urban fabric can go broken to create a new infrastructural network. This network must still facilitate vehicular accessibility, while the connectivity can be scaled down. Instead, the walkability and cycleability must be improved and quick, safe, and easy routes should be realized. Especially in terms of the streets design, new streetscape have to be introduced, that can ensure a safe and fluid ride for cyclist and pedestrians, while at the same time facilitating the current car use. Throughout the neighborhood, locations should be assigned for parking spots that are integrated in the redesign of courtyard or within new construction.

On the level of the living domain, the realisation of new dwellings is taken on. This is one of the most strategic interventions, because the position of new building blocks can redefine the urban fabric as well as public space. The first step is to analyse how the new mobility network redefines streets. The new mobility network offers new places where building blocks can be placed, that were before dedicated for infrastructure. The next step is strategically places new buildings that can close off courtyards. These new building blocks strengthen the borders between public and private and are a crucial part in the privatisation and collectivation of courtyards. The existing housing stock must be analyzed in order to make a selection for renovation, top-up extension, and transformation. Preserving, updating, and transforming the existing housing stock is the foundation to a succesful transformation, as it determine the local character in terms of architecture as well as community. Lastly, demolition should limited as much as possible. If demolition is considered, it provides a perfect densification opportunity. The new construction must translate the form language of the existing building blocks to a more efficient and dense form that provides the missing elements of the existing situation. All new building block must provide a diverse range of housing typologies to provide housing for everybody. New construction building will also have to provide integrated parking solutions and introduce new functions and amenities.

The lowest level is that of public space. Here, the balance of public and private space is dealt with. Privatising and collectivising are important interventions that can boost the liveability, as it can create more activity, an increased sense of belonging and an improved feeling of safety. Especially in dense areas, qualitative and functional outdoor space is important in order to provide usable outdoor space to the stacked housing. Besides a new balance in public, collective, and private space, the borders between these places need to be clearly defined in order for to work as they are designed for. These transitions are also key in facilitating social interaction. To ensure privacy, the borders between private and private can be hard and closed. The transition from private to collective however needs to be distanced but transparant. In this way, the distancing ensures privacy, while at the same time individualisation is limited due to the transparancy. The border between collective and public can have more different forms, but it must always be a clearly defined border. Someone that walks by must have the sense that a collective space is entered when crossing the particular border. As already introduced, social interaction is also dealt with on this level. This is done through communal, collective, public functions. These places can be forced or voluntary. A shared entrance or bicycle parking can force a form of social interaction, while a communal living room or collective workplace can facilitate initiated social interaction.

These conclusions will become more clear and explicit in my design proposal that is being developed at the moment. The specific design intervention will come from the design proposal and a first set of them can be found on the next page. They follow from the conclusions stated here.

5.2 Design Proposal

The framework is being further tested and validated with the use of a design proposal. Herefore, a location in the south-west district of The Hague is chosen as a base. In some intervention, the specific location is implemented, while in other the location is merely used to build a typology for which a design is made.

On the level of mobility, the vehicular network has to be optimised. The car-oriented network needs to be transformed to one that facilitates the car, but prioritises the accessibility and connectivity of pedestrians and cyclists. Therefore, two main axes are determined that can function as main access road through the neighborhood. A part of the other streets will be transformed to so-called desination streets. These streets are still car accessible, but they limit through traffic. However, the street does facilitate a connection for pedestrians and cyclists. The last step is to indicate another axis that functions as a access route through the neighborhood for cyclists. This route is solely accessible for cyclists and pedestrians and will be part of a longer route that facilitates quick and safe routes for cyclists to move through the district.

The transformation of the mobility network creates a diverse range of street typologies, due to different functioning and different needs. Therefore, a variety of streetscapes are designed to accomodate the new function of that street, of which a selection can be seen below. The fietsstraat is only accessible for cyclists and pedestrians and has a big bike parking capacity. This street has priority at intersection with other car-accessible streets. The woonerf is a multi-
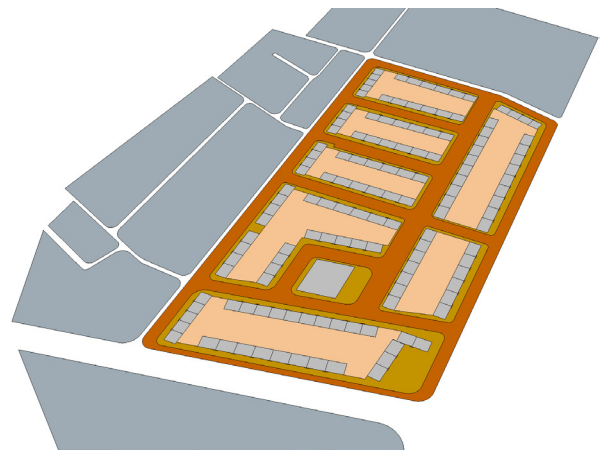
Existing car-oriented network
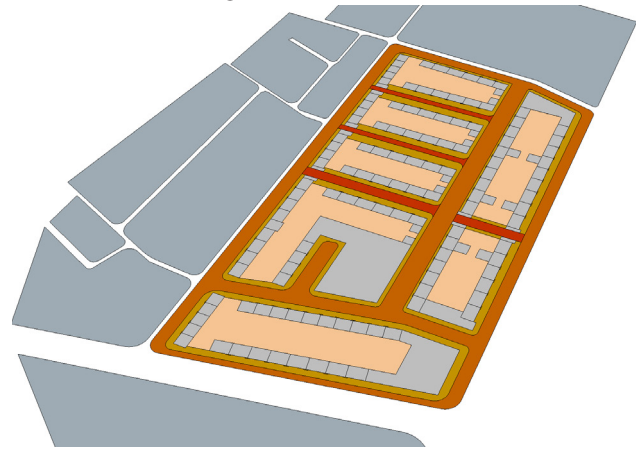
Main vehicular axis with slow traffic streets

Fietsstraat

Woonerf
Woonstraat

Wadistraat

Woonerf
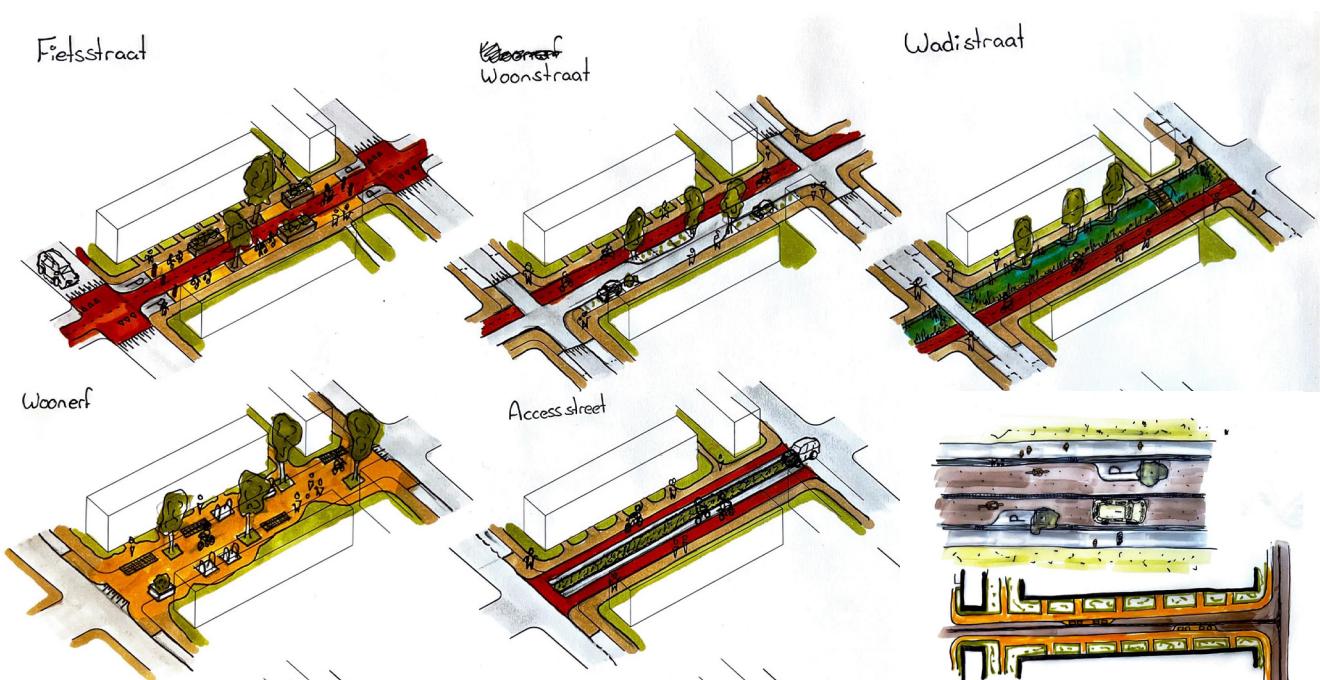
Access street

functional street. It consists of one big plain without any dedicated traffic lanes, although it is car accessible. This street limits through traffic while still facilitating the possibility to park for loading, unloading, and pick-ups. The street can host any other activity, such as children playing football or a local residents' barbecue. The woonstraat functions more as a access street. It consists of a seperate cycling lane to ensure safety and a curved car lane to limit high speeds. Car parking is facilitated along the street. The access street is a combination of the fietsstraat and the woonstraat. The street is accessible for both cyclist as well as cars, but limits through traffic and other social functions. Lastly, the wadi street combines cyclists connections with climate resilience. The wadi ensures that the cycling path will always be accessible, as it will catch any excess water from heavy rainfall. It also helps cool down the street and the calm and green character will boost mental well-being for the local residents. The design provides a set of design interventions that can be found below. The design also takes a general approach on ways of enhancing traffic safety and prioritising of slow traffic on streets through materialisation, zoning and sizing of lanes.
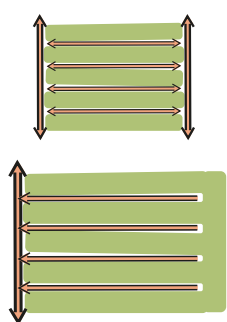
Reroute traffic flows
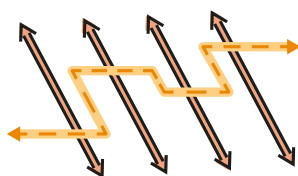
Divert vehicular flows to the advantage of slow traffic
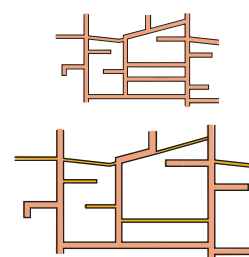
Redesign infrastructure by new hierarchy

Top-up extentions -> improve liveliness and business

Diverse greenery -> Biodiversity and climate adaptive

Dedicated parking -> safer streets

Slow traffic orientated -> safety and promotion active mobility

The next level looks at the living domain and ways of transforming and adding building blocks. The existing situation provides a monotous housing typology, building character and spatial identity. Strategic interventions and a diversification can enhance the spatial character and positively contribute to liveability. The first step is to strategically add building blocks in between the existing ones. This can be done on places that used to be dedicated for roads, but are not anymore. These can be realised as gate buildings to still facilitate bicycle connections. The other option is to place building on the edges of courtyard and closing them off. The groundfloor of these head buildings can house communal functions for the residents around the courtyard, such as bicycle and car parking, a shared laundry room, a communal living room or a collective workshop and workspace. The next step is to indicate buildings that are suitable for a vertical extension. The vertical extension is a way to finance the renovation of an existing building and improve its technical and functional qualities. The light, open and spacious character should be taken into account when indicating where top-up extensions can be realized. The last step is to take on the buildings that only have the option to be demolished. A smart and efficient densification possibility comes up here that should enhance the existing character and provide new qualities and amenities for the existing situation. Because of their scale, these buildings are perfectly suitable to integrate larger parking facilities, as well as new public amenities such as sports facilities, health care, shops, civil functions, and childcare.
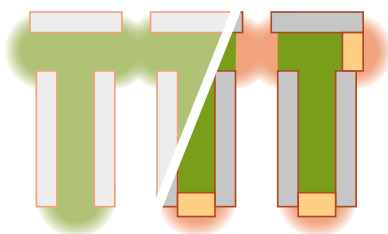

Enclose courtyards

Build with the existing
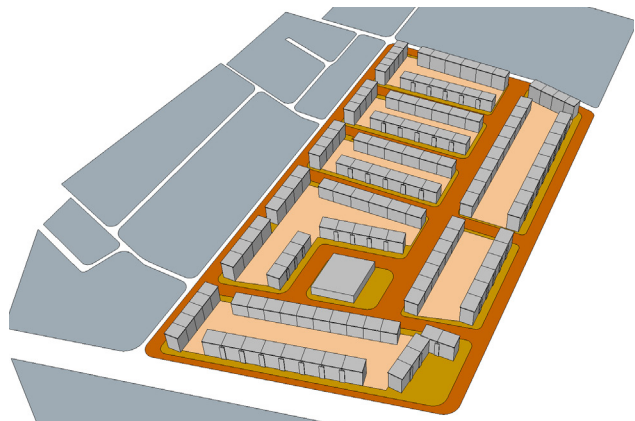
Existing situation of tenement flats
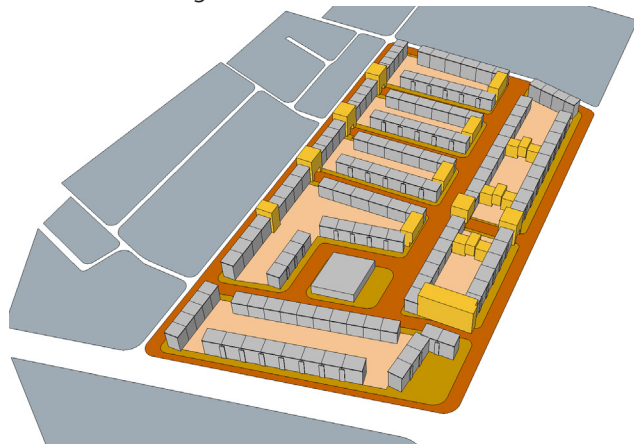
Block addition to close courtyards

Top-up extentions to diversify
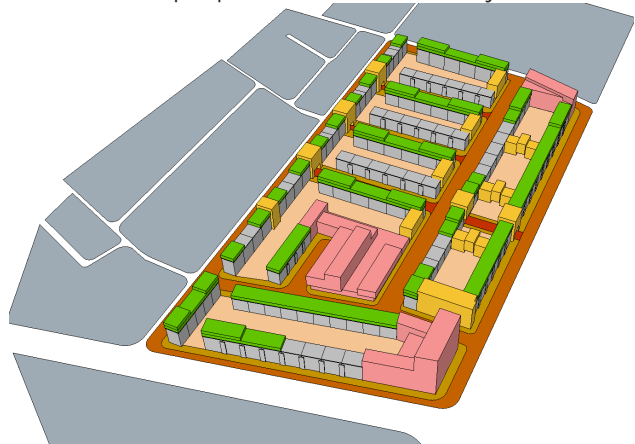

Strategic demolition to optimise urban fabric
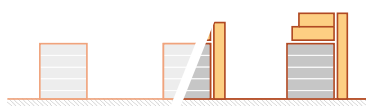
The last level of the social program focuses on the open space around the building block and, more specifically, the courtyards. As said before, privatisation and collectivisation of courtyard can contribute to better liveability. Therefore, a new balance in public, collective, and private space must be designed. In the design, the dwellings on the ground floor receive a private terrace or garden that is adjacent to a collective courtyard. The collective courtyard functions as additional outdoor space for the apartments as well as a place where residents can meet and interact. The design and program of the collective courtyard must be developed through participation tracks. There should be a part that has a predesigned function, while the courtyard still provides places for initiatives. In this way, the outdoor space preserves a qualitative function in addition to the function and program that residents can roll out themselves. The next step is to look at the transitions between spaces, moving from public to collective to private. A variety of greenery functions as a distancing but visible border between private and collective. A platform or hedge can depict the border between collective and public. Especially the surrounding dwellings and private gardens private the social control for the collective identity.

New block closes off courtyard -> safer controlled space
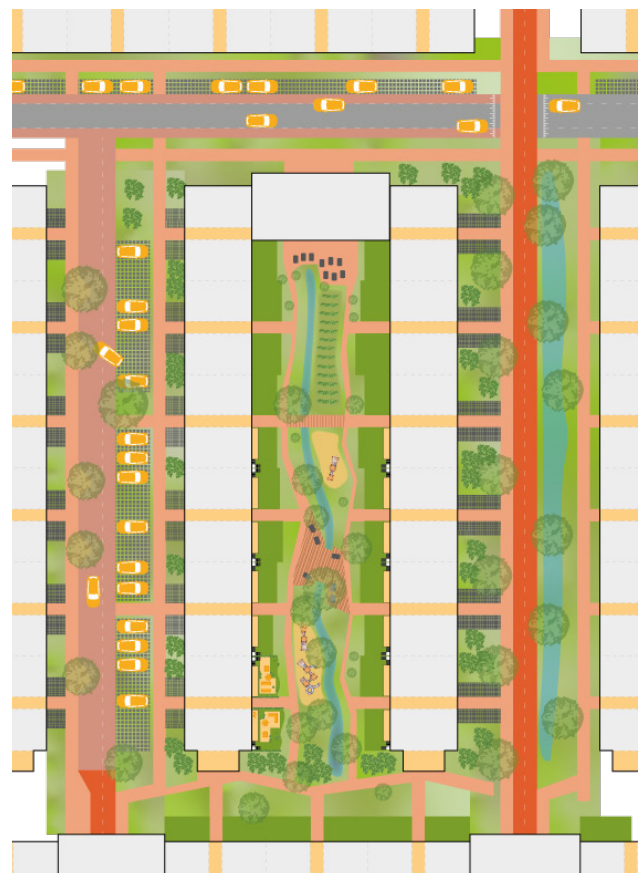
Central entrance -> increased social interaction and accessibility



Terrace on ground floor -> activation and accesibility to courtyard

Diverse greenery -> climate adaptive and biodiverse design

Functional design -> activation courtyard & social interaction

The last step is to look at the entrances and accessibility circulation in and around the buildings. They can form an important role in promoting social interaction. At the moment, there are many portico flats. These buildings consist of multiple small stair cores that gain access to a dwelling on either side on every level. Although their size is quite small, the amount of people that use this staircore feels small and safe enough to get to know one another. Galery and corridor circulations are connected through one or two stair cores and they connect dwellings horizontally. A wide galery can provide the opportunity to meet fellow neighbors and sit down together. Addition partial stairs can break to horizontal character and improve social interaction to other levels. These circulations should extent onto the collective courtyard. In this way, the accessibility from the street towards dwellings and communal places functions as a guide to initiate and facilitate social interaction.
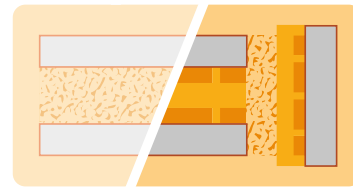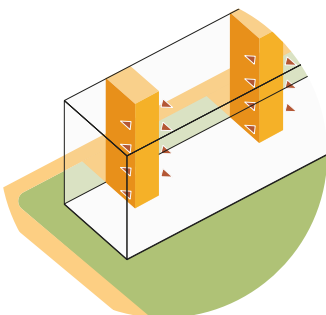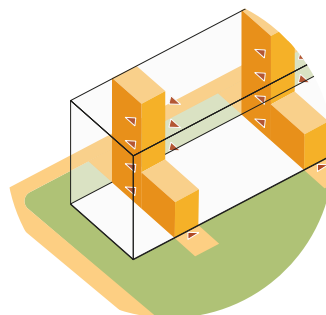

New balance in
collective-private-public
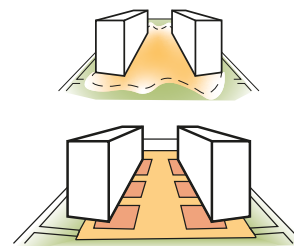
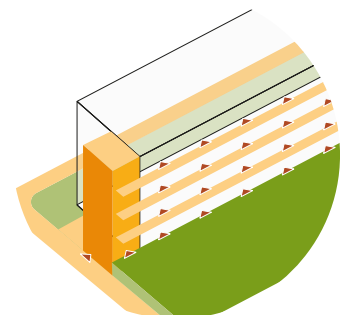

Clear transitions
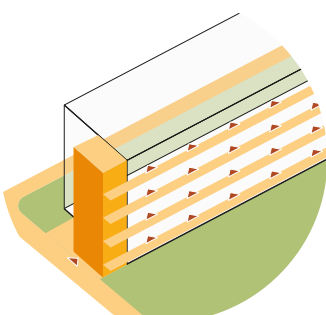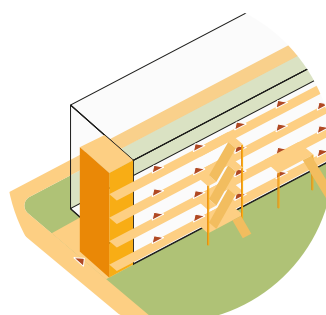public-private space

Portico

Portico double entry

Gallery + platform

Central core + gallery

Gallery + staircases

Concept compexity and ambiguity

The research aimed at investigating the topic of densification in relation to liveability. Both concepts are quite controversal societal subjects. Throughout history, there have been many protest against densification projects, because people often are afraid that their living environment will forever be changed and that the new situation will harm the situation they used to know. However, in many cases, people tend to quickly forget what has changed after realisation of the project. This is especially the case with projects that have been carefully designed to fit perfectly into the existing urban fabric. Still, it is a very challenging process to convince residents that the outcome of the project is completely worth the little amount of disturbance of the construction of that project. Liveability issues have to overcome a similar challenge. There is an ever lasting debate over neighborhoods that are set aside as unliveable. In some cases residents do not agree with the unliveable stamp they receive, because they view liveable from a whole different perspective than the group opposing them. The scientific field acknowledges the complexity that comes with the concept of liveability. Besides the fact that there is a lot of ambigiuty in the definition of liveability, the way it is measured and determined is also not straight forward and conclusive.

Research approach

With this knowledge, I might have asked myself to do the impossible. My method focused on two strategies. The first is diving in the scientific field through literature. This was a good starting point, as it would give me a proper understanding of how the concept came to be and what it all entails. However, that last aspect is exactly where I lost track. The complexity, ambiguity, fastness of the concept had me looking into anything and everything. It was very difficult to transfer all the scientific knowledge on the subject to my personal opinion on it and to my project. That become even more apparent at my P2 presentation, where I received some constructive critique, as I tried to cover the whole subject of liveability with all kind of redevelopment strategies. I received to task to narrow it all down to the essence of the aim of my project, which was to look at liveability from the point of view of densification. After that, theory on the compact city came to be the guiding link between liveability and densification. While the scientific knowledge of one subject left me searching, the knowledge on another subject provided me with the findings. Although this process helped me progress in my project, it continued to be the biggest challenge to be able to explain and validate how densification and liveability are related and, more specifically, how densification can benefit liveability.

My second methodology helped me a lot with this challenge, which was case study analysis. Analysing many realised projects helped me understand how I could translate my theoretical knowledge into design principles and interventions. By applying certain design interventions from the case studies onto my own project I could test them and see if they would reach the goals of my framework. In my opinion, research by design is key here, because the examples from the case study are all from a different context. By working with a research by design approach that tests the findings from the case studies, design principles and intervention can be found that would work in my project. The iterative process of analysis cases and implementing examples in my design develops a good understanding of what could work and what would not. It also helps in validating why it would have a high potential of success.

The next step of validating my findings is something I did not execute. The conclusion from my thesis explains that liveability can only be measured to make a calculated guess of how and where liveability issues could be found. The only way to determine the effects on liveability is by asking residents, through surveys, interviews or questionnaires. Since the start of my project I have been in doubt whether I needed to conduct these interviews. In the early stages of the project interviews could have provided my information on what people think is not a liveable neighborhood. However, a lot of research has already been done on the so-called problematic neighborhoods, therefore I did not want to conduct interviews, because it would give me a subjective view on the situation. At this stage of my project, workshops or interviews with residents on the proposed interventions

of my project would be perfect. As explained in the conclusion, participation tracks are crucial for these kind of redevelopment projects. We are designing for people who call the place their home, so their voice and experience should be of great influence on the design and approach of the project. Also for my project, a participation workshop would be a good way to validate my findings. Although I tried to back up my findings with evidence from literature and examplary projects, in the context of the concept of liveability, I would value the validation from a personal perspective to a greater extent. I do think that it is a pity that I did not come to this stage in the project, but I also realise that organising such a workshop, gathering the results and conducting a statistical analysis on the results is far from my capabilities and interest and I would argue to not have been able to round up the research by this time.

Tutoring and feedback

My mentors, Reinout and Robbert Jan, guided me through my project. Reinout guided me on the theoretical argumentation of my process. His knowledge on the topic of liveability, specifically in the context of the post-war neighborhood, helped me on getting the focus sharp on what I was trying to do. He understood my struggle with the complexity of the concept and through his feedback steered me on constantly connecting liveability to densification, which got lost on me sometimes. Robbert Jan guided me in the implementation of all the theory I gathered. His feedback challenged me to translate the goals and guidelines that I got from my research to design principles and interventions. This worked very well for me, because through the development of these interventions I could better understand how the goals and guidelines work and whether they would achieve the intended target. In this way, the feedback also helped me stay on track on the methodology I set out to work on. The combination of theoretical and practical feedback through the research and design process helped in a way that I was constantly challenged to combine both my research findings into the design.

Graduation studio Design of the Urban Fabric

The urban fabric studio focuses on the physical urban environment. The aim of the approach of this studio is to foster a sustainable and liveable urban environment through urban design, with a great focus on people and social life. My graduation project complies with these topics as it looks at one specific typology that is a significant part of our urban fabric. It is significant in size and from a social and public perspective. The post-war neighborhood typology is designed for a different time and different life and does not sustain a qualitative, sustainable, and healthy living environment. A different and innovative look on the urban design can have the ability to transform these places into a sustainable and liveable urban environment. The key factor here is to take into account the tangible and intangible aspects. The tangible aspects are the physical characteristics of a place while the intangible aspects look into people's behaviour, needs, movement, and social life in urban areas. We as urbanists have the ability to create and build an urban environment that is fair and healthy for all, where people can live better together. However, it is important to understand that people effectively have to make a place their own. Therefore, we the urbanists must study social life and create an environment where social life can flourish, while at the same time providing urban living qualities.

Research and design

Research is critical for designing. It lays the foundation, clarification, and validation for the design. Without it, the design is a selfish implementation of an unrealistic ideology. The research I conducted provided me with the ideas and tools that I implemented in my design. It gave me a direction and a goal that my design should serve. As the design developed, it gave me new insights and sometimes conflicting ideas. The development of the design, in this way, shaped the research. Practice does not always stand in line with theory. Research becomes relevant if it can find a practice to land in. In this way, my research is being reshaped by my design. It stretches and moves borders. This proves the strength of research by design or design by research. It is a way to connect theory with practice and vice versa. Research has the ability to validate a design, and design can make research relevant and viable.

Methodology

The graduation project focuses on the relationship between densification and liveability. Especially the second concept is a fast and complex concept. It is possible to write a dozen theses on this topic alone. Therefore it was important to create a clearly defined scope that would ensure me to stay on topic. While the connection to densification seems complex to prove and understand, it helps to create this scope for the broad topic of liveability. The case study analysis aided in finding this connection and setting up the scope. When comparing cases to one another, it becomes clear what is relevant and what falls outside of the set scope. Therefore this method helped me to sharpen my focus and find relevant tools and ideas that connect both of my topics. Here, it is key to be critical to the investigated cases. Every case is different and therefore not everything works similar in a different case. I learned to find the principles within comparative cases through the intervention, mechanism, and effect of that principles. This led to finding ways to learn from the cases and as a next step implement them into my design. The method that further in my design and research shall strengthen is on-site interventions, finding out about social life and people's needs and motives. This will help me make concrete and grounded conclusions.

Scientific and societal relevance

The topic of my graduation is relevant to this time and age. We are at a time when we have been struggling with the typology of post-war neighborhoods. Not only with their urban fabric that is designed for a different time and lifestyle but also in terms of building and living quality. Society is looking for a way to improve the living quality of these places while also creating a sustainable and resilient building stock. The College van Rijksadviseurs has been investigating the densification approaches in our Dutch history and knowledge platforms such as Platform31 are seeking to find an answer to how the inevitable densification strategies can turn things around positively in vulnerable areas. The scientific field of urbanism succeeds only partially in addressing the relationship and synergies between the improvement of liveability through densification. Densification has the ability to transform and reshape our existing urban fabric, without having to erase a large part of it. In my opinion, this idea has been under shadowed by the political tendencies considering post-war neighborhoods and social housing. For decades, we have been unable to improve our most vulnerable living environments as well as deal with our housing shortage. Now is the time to find sustainable and resilient solutions that will provide perspective.

Transferability of research results

Within my graduation project, I aim at creating a concept or framework that can be broadly applied, on top of the design proposal. The design proposal functions as one outcome of an implementation of the framework to give an example. The relevant outcomes from the research by design and literature research can be found in the design proposal. The outcomes have also been transferred into a design framework. This framework sets guidelines and proposals for the approach of any post-war neighborhood transformation project. The guidelines, principles, and focus points of the framework are based on common factors that can be found in any post-war neighborhood. Therefore, the focus is on a generic approach to a broad typology of our urban environment, making it relevant to more than one location, since every city has a post-war area.

List of references and sources

Ahlfeldt, G., Pietrostefani, E., Schumann, A., Matsumoto, T. (March 2018). *Demystifying Compact Urban Growth: Evidence from 300 Studies from across the World.* OECD Regional Development Working Papers

Argiolu, R., van Dijken, K., Koffijberg, J., et al. (June 2008). *Bloei en Verval van Vroeg-naoorlogse Wijken*. Nicis Institute in collaboration with University of Utrecht, Movisie and Erasmus University Rotterdam

Bijlsma, L., Bergenhenegouwen G., Schluchter S., Zaaijer L. (2008). *Transformatie van Woonwijken met Behoud van Stedenbouwkundige Identiteit.* Ruimtelijk Planbureau, Den Haag. NAi Uitgevers, Rotterdam

Blom, A., Jansen, B., van der Heiden, M. (April 2004). *De Typologie van de Vroeg-naoorlogse Woonwijken.* Projectteam Wederopbouw van de Rijksdienst voor de Monumentenzorg, Zeist

Centraal Bureau voor de Statistiek. (2017, November 17). *Veel naoorlogse stadswijken sociaaleconomisch zwak.* Centraal Bureau Voor De Statistiek. Retrieved on 04-05-2023 from https://www.cbs.nl/nl-nl/nieuws/2017/46/veel-naoorlogse-stadswijken-sociaaleconomisch-zwak

Centraal Bureau voor de Statistiek. (2022, February 28). *Veiligheidsmonitor 2021*. Centraal Bureau Voor De Statistiek. Retrieved on 01-05-2023 from https://www.cbs.nl/nl-nl/publicatie/2022/09/veiligheidsmonitor-2021

Dalhuisen, G. (August 2006). *Cultuurhistorische Waarden in de Naoorlogse Wijk. Een Prioriteit bij Herstructurering?* Faculteit der Ruimtelijke Wetenschappen, Rijksuniversiteit Groningen

De Jonge, H. (14 April 2022). *Kamerbrief bij Rapporten 'Leefbaarometer 3.0, Instrumentontwikkeling' en 'Leefbaarheid in Nederland 2020'*. Ministerie van Volkshuisvesting en Ruimtelijke Ordening, Den Haag

de Jonge, H. (4 July 2022). *Aanbiedingsbrief bij Nationaal Programma Leefbaarheid en Veiligheid*. Ministerie van Volkshuisvesting en Ruimtelijke Ordening, Den Haag

Doff, L. (2019, April 21). *Toen in Dordt: luchtfoto's van 1900 tot nu - indebuurt Dordrecht*. Indebuurt Dordrecht. Retrieved on 04-05-2023 from https://indebuurt.nl/dordrecht/toen-in/toen-in-dordt-luchtfotos-van-1900-tot-nu~78708/

Dorigo, M., Leidelmeijer, K., Zeelenberg, S. (February 2017). *Aandachtswijken op Eigen Kracht. Ontwikkeling van de Leefbaarheid in de (Voormalige) Aandachtswijken*. Platform31, RIGO Research en Advies, Den Haag

Eichler, J. (April, 2010). *Spatial-Social Solutions for Dutch Post-War Neighbourhoods.* Delft

Forrest, R., & Kearns, A. (2001). *Social Cohesion, Social Capital and the Neighbourhood*. Urban Studies, 38(12), 2125–2143

Gelders Archief. (n.d.). *Luchtfoto's Arnhem Presikhaaf*. Retrieved on 04-05-2023 from https://www.geldersarchief.nl/bronnen/archieven?mivast=37&mizig=210&miadt=37&miaet=1&micode=1524&minr=62676192&miview=inv2&milang=nl

Geuzenveld (AUP) - Amsterdam op de kaart. (n.d.). amsterdamopdekaart.nl. Retrieved on 04-05-2023 from https://amsterdamopdekaart.nl/c/103/Geuzenveld_%28AUP%29

Historisch Centrum Limburg, te Heerlen (voormalig Rijckheyt). (n.d.). *Meezenbroek en Palemig in Heerlen.* Retrieved on 04-05-2023 from https://www.archieven.nl/nl/zoeken?mivast=0&mizig=210&miadt=62&miaet=14&micode=328-003&minr=1259209&miview=inv2&milang=nl

Hoogland, J. (2019, January 28). *Fotoserie: De Gaarden vroeger en nu - indebuurt Den Haag*. Retrieved on 06-04-2022 from https://indebuurt.nl/denhaag/toen-in/fotoserie-de-gaarde-vroeger-en-nu~78743/

Hoven Passage Delft - WEBO. (2022, February 2). WEBO. Retrieved on 06-04-2022 from https://www.webo.nl/en/projecten/hoven-passage-delft/.

Leidelmeijer, K., Mandemakers, J. (March 2022). *Leefbaarheid in Nederland 2020, een Analyse op Basis van de Leefbaarometer 3.0*. Atlas Research, Amsterdam.

Leidelmeijer, K., van Iersel, J., Frissen, J. (19 October 2018). *Veerkracht in het Corporatiebezit.* Kwetsbare Bewoners en Leefbaarheid. RIGO Research en Advies, Woon- Werk- Leefomgeving, Amsterdam

liveability. (2023). Retrieved on 17-04-2023 from https://dictionary.cambridge.org/dictionary/english/liveability

Lörzing h., Harbers A., Schluchter S. (2008). *Krachtwijken met karakter, bevindingen*. Planbureau voor de Leefomgeving, Den Haag. NAi Uitgevers, Rotterdam

Lörzing h., Harbers A., Schluchter S. (2008). *Krachtwijken met karakter, verdieping. Een stedenbouwkundige typologie*. Planbureau voor de Leefomgeving, Den Haag. NAi Uitgevers, Rotterdam

Mandemakers, J., Leidelmeijer, K., Burema, F., Halbersma, R., Middeldorp, M., Veldkamp, J. (December 2021). *Leefbaarometer 3.0, Instrumentontwikkeling*. Atlas Research, Amsterdam.

Maslow, A.H. (1970). *Motivation and Personality*. New York: Harper and Row.

Meurs, P., Steenhuis M., Emmerik, J., Plomp, M., Voerman, L. (June 2006). *Cultuurhistorisch Onderzoek en Ruimtelijke Analyse Utrecht Naoorlogse Wijken: Kanaleneiland*. Urban Fabric, Steenhuis Stedenbouw/Landschap, Schiedam

Ministerie van Algemene Zaken (2007), *Samen werken samen leven. Beleidsprogramma Kabinet Balkenende IV 2007-2011*, Den Haag: Ministerie van Algemene Zaken

Ministerie van Binnenlandse Zaken en Koninkrijkrelaties, (July, 2021*). Staat van de Woningmarkt, Jaarrapportage 2021*. Ministerie van VROM

Ministerie van Binnenlandse Zaken en Koninkrijkrelaties, (March, 2022). *Nationale Woon- en Bouwagenda*. Volkshuisvesting en Ruimtelijke Ordening.

Moscoviter, H., et al. (2007). *Grootschalig maar subtiel, Onderzoekend ontwerpen aan naoorlogse wijken.* Rotterdam, Van Schagen architecten

Nabielek, K., Hamers, D. (2015). *De Stad Verbeeld. 12 Infograpics over de Stedelijke Leefomgeving*. Plan Bureau voor de Leefomgeving, Den Haag

Nationale staalprijs. (n.d.). *Appartementengebouw De Karel Doorman. Nationale Staalprijs*. Retrieved on 06-04-2022 from https://www.nationalestaalprijs.nl/project/appartementengebouw-de-karel-doorman.

Nederland, Zuid-Holland, Gemeente Den Haag, 28-04-2017; stadsdeel Leidschenveen-Ypenburg, de Vinex-wijk Ypenburg, op de plaats van het voormalige vliegveld Ypenburg. New residential quarters near The Hague. (2017, April 28). Retrieved on 06-04-2022 from https://www.siebeswart.nl/image/I0000rv_bSyZ4s3Q.

Onderzoek – Lemon de leefbaarheidsmonitor. (n.d.). Retrieved on 01-05-2023 from https://www.lemon-onderzoek.nl/onderzoek/

Renovatie 148 woningen Gouda, KAW. (2022, August 18). KAW. Retrieved on 11-04-2023 from https://www.kaw.nl/projecten/renovatie-complex720-gouda/

ten Dijke, C., Mispelblom Beyer, B., Rickert, N., et al. (April 2010). *Prachtig Compact NL.* Werkgroep Binnenstedelijk bouwen in collaboration with College van Rijksadviseurs, Atelier Rijksbouwmeester. Den Haag

Uyterlinde, M. (30 April, 2007). *Bekijk: Prachtwijk moet winnende wijk zijn*. NEMOKennislink. Retrieved on -1-05-2023 from https://www.nemokennislink.nl/publicaties/prachtwijk-moet-winnende-wijk-zijn/

Uyterlinde, M., Leidelmeijer, K. (March 2017). *Kwetsbare wijken in beeld*. Platform31 , Den Haag

Van Bree, L. (2021, July 8). *Drastische verbouwing Den Haag Zuidwest: dit staat de bewoners te wachten*. Omroep West. Retrieved on 06-04-2022 from https://www.omroepwest.nl/nieuws/4426462/drastische-verbouwing-den-haag-zuidwest-dit-staat-de-bewoners-te-wachten.

Van den Bout, J., van Kesteren, J., Gorissen, C., de Koning, P., Stoeckart, J. (November 2004). *Stedenbouwkundig Plan Poptahof Delft.* Palmboom & van den Bout, Stedenbouwkundigen bv. Delft

van der Velden, J., Can, E. (February, 2022). *75 Jaar Stedelijke Vernieuwing en Wijkaanpak*, Kennisdossier Stedelijke Vernieuwing. Platform31, Den Haag

Van Meijel, L. (2001). *De Naoorlogse Wijk in Historisch Perspectief: de Praktijk.* Rijksdienst voor Monumentenzorg, afdeling Projectteam Wederopbouw. Den Haag

Vanschagen Architecten. (2021, June 29). *Vanschagen Architecten | Klarenstraat*. Retrieved on 11-04-2023 from https://www.vanschagenarchitecten.nl/portfolio_page/klarenstraat/

Veelers, D. (4 November 2021). *Cultuurhistorische Verkenning – Herijking Cultuurhistorische Waarden Den Haag Zuidwest.* Crimson Historians & Urbanists, Rotterdam.

Volkshuisvesting en Ruimtelijke Ordening (July, 2022). *Nationaal Programma Leefbaarheid en Veiligheid.* Ministerie van Binnenlandse Zaken en Koninkrijkrelaties, Volkshuisvesting en Ruimtelijke Ordening, Den Haag.

Von Meding R., Smits W., Drewes J., et al. (June 2020). *Ruimte zat in de stad*. KAW Research and Development, Groningen
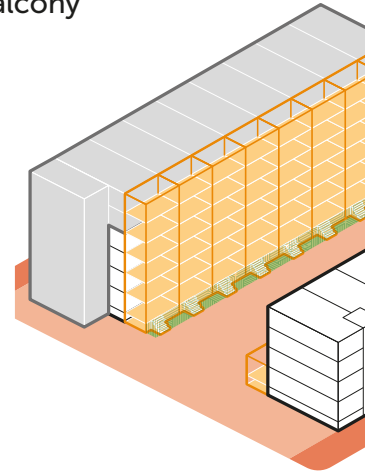
Vroon, P. (1990*). Psychologische aspecten van ziekmakende gebouwen*. Den Haag:

Wijk, AlleCijfers.nl. (2023, December 1). AlleCijfers.nl. Retrieved on 03-05-2023 from https://allecijfers.nl/onderwerpen/wijk/#:~:text=Er%20zijn%2012.822%20buurten%20in,stip%20in%20de%20grafische%20weergave
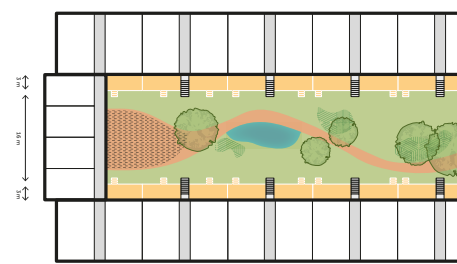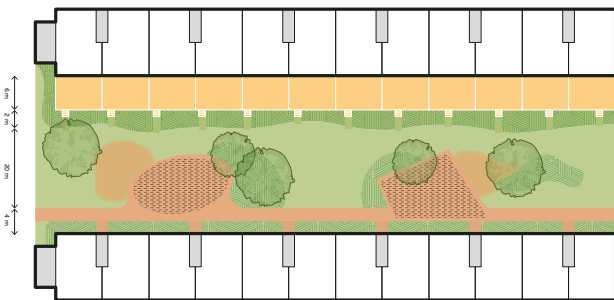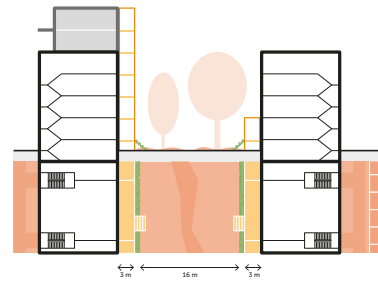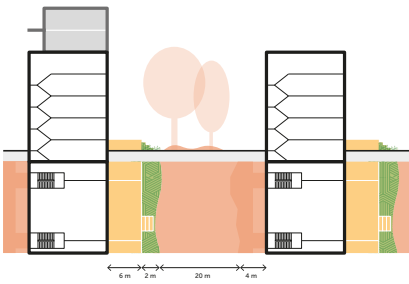
Type I
Platform

PRIVATE *border* **PUBLIC**

6 m   2 m   20 m   4 m

Type II
Balcony

3 m   16 m   3 m
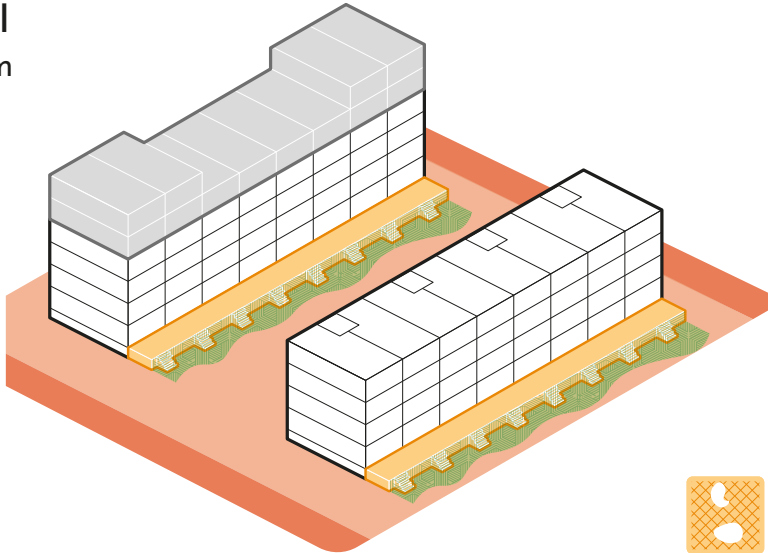
Type III
Garden
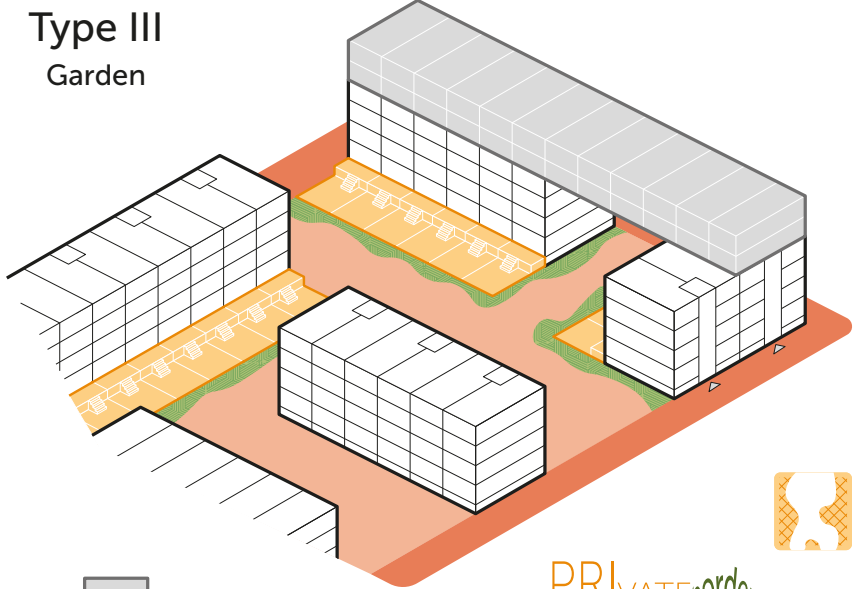
PRIVATE bor der PUBLIC

PRIvate border PUBLIC

12 m   4 m   20 m   2 m   8 m